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December 25, 1979

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UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

National Inventors' Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 9, 1980 from 1:00 p.m. to 5:00 p.m. and Sunday, February 10, 1980 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, February 10, 1980, during which four inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, February 8, 1980 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property and items for the early closing.

Nov. 27, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,395,585, Re. S.N. 074,138, Filed Sep. 7, 1979, Cl. 74/124, TIMER INDEXING MECHANISM, George Obermann, Owner of Record: *The Singer Company, New York, N.Y.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 352

3,451,161, Re. S.N. 071,183, Filed Aug. 31, 1979, Cl. 46/241, TOY TRACK AND VEHICLE THEREFOR, Jerome H. Lemelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 333

3,539,715, Re. S.N. 068,484, Filed Aug. 20, 1979, Cl. 358/102, INFORMATION STORAGE AND REPRODUCTION SYSTEM, Jerome H. Lemelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 233

3,731,414, Re. S.N. 080,487, Filed Oct. 1, 1979, Cl. 40/301, ANIMAL EARS TAGS AND APPLICATORS THEREFOR, Brian Egmont Murphy, et al., Owner of Record: *Delta Plastics Ltd., Palmerston, North, New Zealand,* Attorney or Agent: Roger W. Blakely, Jr., et al., Ex. Gp.: 333

3,811,291, Re. S.N. 082,422, Filed Oct. 5, 1979, Cl. 62/84, METHOD OF OPERATING A REFRIGERATION PLANT AND A PLANT FOR PERFORMING THE METHOD, Lauritz Benedictus Schibbye, Owner of Record: *Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden,* Attorney or Agent: Stephen H. Frishauf, et al., Ex. Gp.: 344

4,033,358, Re. S.N. 074,390, Filed Sep. 10, 1979, Cl. 131/15 R, INTEGRAL CIGARETTE PAPER HOLDER ELEMENT, Duane E. Harrington, Owner of Record: *Inventor,* Attorney or Agent: Richard Esty Peterson, Ex. Gp.: 335

4,040,627, Re. S.N. 059,600, Filed Jul. 23, 1979, Cl. 272/133, FRICTION TYPE EXERCISING DEVICE WITH IMPROVED FRICTION SETTING MECHANISM, Ronald E. Useldinger, Owner of Record: *Inventor,* Attorney or Agent: Gerald L. Moore, Ex. Gp.: 334

4,046,376, Re. S.N. 072,335, Filed Sep. 4, 1979, Cl. 273/54 D, BOWLING PRACTICE DEVICE, Leslie E. Harvey, et al., Owner of Record: *Inventors,* Attorney or Agent: Warren M. Becker, Ex. Gp.: 334

4,049,033, Re. S.N. 076,691, Filed Sep. 18, 1979, Cl. 150/0.5, MOLDED COLLAPSIBLE SOLUTION CONTAINER, Philip G. Ralston, Jr., Owner of Record: *Baxter Laboratories, Inc., Morton Grove, Ill.,* Attorney or Agent: Paul C. Flattery, et al., Ex. Gp.: 241

4,053,564, Re. S.N. 083,890, Filed Oct. 11, 1979, Cl. 423/321 S, EXTRACTION PROCESS FOR PURIFICATION OF PHOSPHORIC ACID, James L. Bradford, et al., Owner of Record: *Occidental Petroleum Corporation, Los Angeles, Calif.,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 113

4,098,406, Re. S.N. 082,992, Filed Oct. 9, 1979, Cl. 206/601, POLYMER FILM HAVING LINEAR TEAR PROPERTIES, Norman J. Otten, et al., Owner of Record: *Tower Products Inc., Mundelein, Ill.,* Attorney or Agent: William M. Lee, et al., Ex. Gp.: 241

4,100,133, Re. S.N. 066,992, Filed Aug. 16, 1979, Cl. 260/45.9 L, AIR-DRY CURABLE COMPOSITIONS COMPRISING DICYCLOPENTENYL (METH) ACRYLATE COPOLYMERS AND NON-VOLATILE REACTIVE MONOMER, AND CURED COATINGS AND IMPREGNATIONS OBTAINED THEREFROM, William D. Emmons, et al., Owner of Record: *Rohm and Haas Company, Philadelphia, Pa.,* Attorney or Agent: Lester E. Johnson, et al., Ex. Gp.: 141

4,109,392, Re. S.N. 065,911, Filed Aug. 13, 1979, Cl. 123/143, POCKET LEVEL, Walter E. Streeter (deceased) by James R. Streeter (executor), Owner of Record: *Mayes Brothers Tool Manufacturing Co., Johnson City, Tenn.,* Attorney or Agent: Charles L. Lovercheck, Ex. Gp.: 342

4,110,472, Re. S.N. 077,197, Filed Sep. 20, 1979, Cl. 424/330, DERIVATIVES OF 1-(DISUBSTITUTED PHENOXY)-3 AMINO 2-HYDROXYPROPANES, Rudolf Hiltmann, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 125

4,111,323, Re. S.N. 076,732, Filed Sep. 18, 1979, Cl. 215/230, CROWN CLOSURE, Isao Ichinose, et al., Owner of Record: *Japan Crown Cork Co., Ltd., Tokyo, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 241

4,118,507, Re. S.N. 072,967, Filed Sep. 6, 1979, Cl. 424/278, BENZODIOXINCARBOXAMIDE LIPOGENESIS INHIBITORS, John B. Carr, Owner of Record: *Shell Oil Company, Houston, Tex.,* Attorney or Agent: Frank R. LaFontaine, et al., Ex. Gp.: 125

4,135,002, Re. S.N. 077,942, Filed Sep. 24, 1979, Cl. 426/482, METHOD OF STRIP CUTTING RAW POTATOES, Joseph L. Hodges, et al., Owner of Record: *Ore-Ida Foods, Inc., Boise, Id.,* Attorney or Agent: Philip A. Mallinckrodt, et al., Ex. Gp.: 173

4,138,585, Re. S.N. 083,646, Filed Oct. 11, 1979, Cl. 560/159, PROCESS FOR PREPARING N-ALKOXYCARBONYL-N-ALKYLCYANAMIDE, Charles DeWitt Adams, Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Charles E. Krukiel, Ex. Gp.: 126

4,139,002, Re. S.N. 080,706, Filed Oct. 1, 1979, Cl. 128/80 C, UNIVERSAL KNEE ORTHOSIS, Manuel J. Almeida, Owner of Record: *Inventor,* Attorney or Agent: Elliot A. Salter, et al., Ex. Gp.: 335

4,148,017, Re. S.N. 076,319, Filed Sep. 17, 1979, Cl. 340/365 S, DEVICE FOR DETECTING A KEY SWITCH OPERATION, Norio Tomisawa, Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 234

PATENT NOTICES

Certificates of Correction for the Week of Dec. 25, 1979

3,918,811	4,146,634	4,157,199	4,164,563
3,924,129	4,148,509	4,158,708	4,164,725
3,989,948	4,148,830	4,159,239	4,164,756
4,033,287	4,149,326	4,159,499	4,165,183
4,046,648	4,149,513	4,161,335	4,166,122
4,066,408	4,149,540	4,161,505	4,166,372
4,086,271	4,149,742	4,161,585	4,166,388
4,087,243	4,149,900	4,161,586	4,166,551
4,099,921	4,150,716	4,161,587	4,166,800
4,116,294	4,151,737	4,161,781	4,166,903
4,116,628	4,152,968	4,161,791	4,167,029
4,118,243	4,153,004	4,162,513	4,167,270
4,122,890	4,153,164	4,163,088	4,167,624
4,133,076	4,153,209	4,163,116	4,167,685
4,134,610	4,154,675	4,163,509	4,168,218
4,145,752	4,154,928	4,163,690	4,168,849
4,146,505	4,156,046	4,163,811	4,170,024
4,146,547	4,157,077	4,164,157	4,171,330
4,146,566	4,157,192	4,164,336	4,171,516
		4,164,464	

Disclaimers

3,912,513.—*Marcel Jacob Monbaliu*, Mortsel, *Gaston Jacob Benoy*, Edegem, *Raphaël Karel Van Poucke*, Berchem, Belgium, *Wolfgang Sauerteig*, Leverkusen, *Dieter Stieler*, Grobenzell, Germany, and *Arthur Henri De Cat*, Mortsel, Belgium. POLYMERIC COMPETING COUPLERS AND THEIR USE IN PHOTOGRAPHIC SILVER HALIDE COLOUR MATERIALS. Patent dated Oct. 14, 1975. Disclaimer filed Oct. 15, 1979, by the assignee, *Agfa-Gevaert, N.V.*

Hereby enters this disclaimer to all claims of said patent.

4,021,111.—*Shoji Kuroishi*, Yokohama, and *Manabu Mochizuki*, Kawasaki, Japan. DEVELOPING DEVICE IN ELECTROPHOTOGRAPHIC COPYING APPARATUS. Patent dated May 3, 1977. Disclaimer filed Nov. 6, 1979, by the assignee, *Ricoh Co., Ltd.*

Hereby enters this disclaimer to claims 1 and 6 and claims 3, 4, 5, 8 and 10.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 17, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	12-22-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-4-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-2-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-9-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-19-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-20-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

REISSUES

DECEMBER 25, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,175

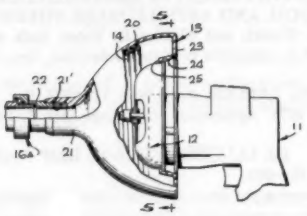
PLUMBERS TOOL

Mark F. Mier, Greenough, Mont., assignor to Lawrence F. Irwin, Sylmar, Calif.

Original No. 3,609,788, dated Oct. 5, 1971, Ser. No. 856,242, Aug. 11, 1969. Application for reissue Jul. 25, 1977, Ser. No. 818,985

Int. Cl.[2] B08B *9/02*

U.S. Cl. 15—104.3 SN **9 Claims**



1. In a plumbers' tool, a hollow container adapted to store a flexible plumbers' snake coiled therein and having an axially disposed neck at the front through which the snake extends and is movable, said container having an annular rear wall defining an opening, a motor having a shaft, an adapter shell mounted on the shaft of said motor, interengaging means on said shell and on said annular rear wall of said container for detachably securing said shell to said container *said interengaging means comprising a plurality of spaced apart slots provided in one of said shell and said annular rear wall and a plurality of spaced apart lugs provided on the other of said shell and said annular rear wall, said lugs being adapted to be receivable in said slots.*

Re. 30,176

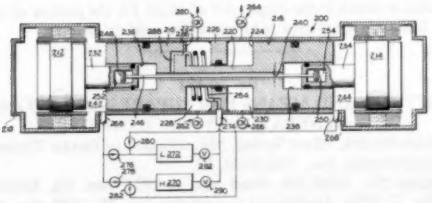
STIRLING CYCLE TYPE THERMAL DEVICE

William T. Beale, Athens, Ohio, assignor to Research Corporation, New York, N.Y.

Original No. 3,552,120, dated Jan. 5, 1971, Ser. No. 812,530, Mar. 5, 1969. Continuation-in-part of Ser. No. 613,272, Feb. 1, 1967, abandoned. Application for reissue Jun. 13, 1977, Ser. No. 806,312

Int. Cl.[2] F02G *1/04*

U.S. Cl. 60—520 **7 Claims**



6. [The invention defined in claim 4 including] *A Stirling cycle type device comprising a pair of opposed displacer pistons, a rigid rod interconnecting the displacer pistons for synchronous motion of said displacer pistons, a cylinder for each of said displacer pistons, a regenerator for each displacer cylinder through which a gaseous operating medium flows during reciprocation of each displacer piston in its displacer cylinder, a power piston operatively associated with each of the displacer pistons and mechanically free to move independently in respect to its associated displacer piston, a cylinder for each of the power pistons, means connecting the pair of power pistons for at least partial synchronous motion of said power pistons, means for adding heat to or removing heat from each end of the displacer cylinders and means providing a power coupling and cooperative connective movement between the displacer pistons and the power pistons associated with said displacer pistons, said last means consisting solely of fluid communication conductors between one end of one power cylinder and one end of the displacer cylinder associated therewith and between one end of the other power cylinder and one end of the displacer cylinder associated with said other power cylinder, means for removing power from or adding power to the power pistons, and* stop means for varying the length of travel of the displacer pistons in their cylinders.

Re. 30,177

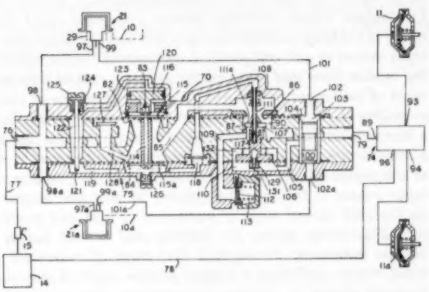
ANTI-SKID CONTROL DEVICE AND SYSTEM

Walter H. Morse, South Windsor, and Ira R. Ames, Jr., Salisbury, both of Conn., assignors to The Jacobs Manufacturing Company, West Hartford, Conn.

Original No. 3,969,003, dated Jul. 13, 1976, Ser. No. 566,761, Apr. 10, 1975. Division of Ser. No. 431,952, Jan. 9, 1974, Pat. No. 3,908,805. Application for reissue Jul. 10, 1978, Ser. No. 923,468

Int. Cl.[2] B60T *8/06*

U.S. Cl. 303—113 **67 Claims**



39. In a brake service air module (75), having a main inlet (76) connectible with a brake service air source (14), a main outlet (79) connectible with an air operable breaking mechanism (11), a main flow passage (85) connecting the main inlet (76) and the main outlet (79), and valve means responsive to the application of an air signal to prevent communication of the main inlet (76) with the main outlet (79) through the main flow passage (85); the improved valve means comprising:

a valve (87) movable within the main flow passage (85) between a first position, wherein communication is established between the main inlet (76) and the main outlet (79), and a second position, wherein such communication is prevented by the valve (87);

a second passage (119) having an outlet located adjacent the main flow passage (85);

means (111 and 111a) for increasing the air pressure in the second passage (119) when the valve (87) is in its second position and for preventing an increase in air pressure in the second passage (119) when the valve (87) is in its first position; and

means (83) located at the outlet of the second passage (119) for reducing the service air pressure, communicated by the brake

service air source (14) to the main outlet (79) through the main flow passage (85), in response to an increase in air pressure in the second passage (119), which develops when the valve (87) is in its second position.

Re. 30,178

FILM TRANSPORTING MECHANISM FOR STILL CAMERAS

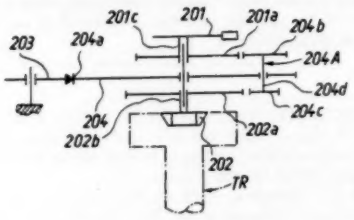
Gunter Fauth, Unterhaching, Fed. Rep. of Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Original No. 3,810,219, dated May 7, 1974, Ser. No. 314,277, Nov. 11, 1972. Application for reissue Apr. 27, 1977, Ser. No. 791,597

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1971, 2161078

Int. Cl.[2] **G03B** *1/62, 19/04*

U.S. Cl. 354—206 **15 Claims**



16. In a photographic apparatus for use with roll film which is collected by a rotary takeup member during forward transport to place successive film frames into a position for exposure to scene light, a combination comprising transmission means including input means movable from a starting position to an end position, first output means receiving motion from said input means to rotate the takeup member during a first stage of movement of said input means to said end position, and second output means receiving motion from said input means during a second stage of movement of said input means to said end position, one of said stages preceding the other of said stages; first arresting means including a scanning device which is arranged to track the film and to effect a termination of movement of said first output means in response to completion of film transport by the length of a frame so that said input means is free to move relative to said first output means during said second stage of movement to said end position; and second arresting means for holding said second output means against movement during said first stage of movement of said input means, including a locking portion which is moved by said scanning device in response to completed film transport by the length of the frame from a first position in which said locking portion blocks said second output means to a second position in which said locking portion permits said second output means to move in response to movement of said input means.

Re. 30,179

COMMON ION EFFECT TO ASSIST LM SEPARATION

Norman N. Li; Robert P. Cahn, both of Millburn, and Adam L. Shrier, Montclair, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Original No. 4,081,369, dated Mar. 28, 1978, Ser. No. 668,128, Mar. 18, 1976. Continuation-in-part of Ser. No. 404,716, Oct. 9, 1973, which is a division of Ser. No. 174,990, Aug. 25, 1971, Pat. No. 3,779,907, which is a continuation-in-part of Ser. No. 36,686, May 12, 1970, Pat. No. 3,637,488, which is a continuation-in-part of Ser. No. 28,094, Apr. 13, 1970, Pat. No. 3,617,546. Application for reissue Oct. 13, 1978, Ser. No. 951,078

The portion of the term of this patent subsequent to Jan. 25, 1989, has been disclaimed.

Int. Cl.[2] **B01D** *13/00;* **C02B** *1/46*

U.S. Cl. 210—22 R **10 Claims**

1. In a process for removing a soluble material from solution by contacting said solution with an emulsion, the external phase of which is immiscible with said solution and permeable to said soluble material and the internal phase contains a reagent which reacts with said permeable soluble material to form an insoluble precipitate, which is trapped in said internal phase, the improvement which comprises maintaining the concentration of said reagent in the internal phase of the emulsion at a level at which the concentration of said soluble material in the internal phase of the emulsion is suppressed by means of the common ion effect to a level below the level to which it is desired to remove said soluble material from said solution.

Re. 30,180

PLURAL COPPER-LAYER TREATMENT OF COPPER FOIL AND ARTICLE MADE THEREBY

Adam M. Wolski, and Charles B. Yates, both of Edgewater Park, N.J., assignors to Yates Industries, Inc., Bordentown, N.J.

Original No. 3,918,926, dated Nov. 11, 1975, Ser. No. 187,923, Oct. 8, 1971. Application for reissue Oct. 5, 1976, Ser. No. 729,879

Int. Cl.[2] **C25D** *5/10, 3/58;* **B23P** *3/00*

U.S. Cl. 428—601 **44 Claims**

25. A process for improving the bond strength of copper foil through the electrochemical treatment of a surface thereof comprising subjecting said surface to a two-step electrochemical pretreatment prior to the application of said electrochemical treatment, the first step of said pretreatment comprising subjecting said surface to an electrolyte containing (1) copper and (2) arsenic, antimony, bismuth, selenium or tellurium under conditions such as to electrolytically deposit thereon a first copper layer which increases the bond strength of the raw foil; the second step of said pretreatment comprising subjecting said surface to a copper-containing electrolyte under conditions such as to electrolytically deposit thereon a second copper layer which substantially conforms to the configuration of the first layer and reduces the powder transfer characteristics of said first layer; and then giving said pretreated foil an electrochemical treatment in which said surface is subjected to a copper-containing electrolyte under conditions such as to electrolytically deposit thereon a third, copper-containing microcrystalline layer which further increases the bond strength of said foil.

35. Copper foil having on a face thereof three electrodeposited superposed layers, the layer closest to said face containing (1) copper and (2) arsenic, antimony, bismuth, selenium or tellurium, the intermediate layer being a copper electrodeposit which substantially conforms to the configuration of said closest layer and serves to reduce the powder transfer characteristics of said closest layer; the third outermost layer being copper-containing and microcrystalline, said third layer increasing the bond strength of said foil over and above the bond strength provided by said closest and intermediate layers.

37. A printed circuit board comprised of a dielectric substrate bonded to which is the copper foil of claim 35, the portion of said foil being closest to said substrate being said third layer.

Re. 30,181

METHOD AND MEANS FOR SUPPRESSING OZONE GENERATED BY ARC LAMPS

Charles Soodak, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

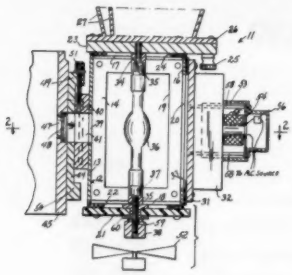
Original No. 3,949,258, dated Apr. 6, 1976, Ser. No. 530,052, Dec. 5, 1974. Application for reissue Jan. 25, 1978, Ser. No. 872,120

Int. Cl.[2] **H01J** *61/52*

U.S. Cl. 313—25 **18 Claims**

1. In combination, an apparatus including a lamp having a light output which generates ozone, and ozone-suppressing means comprising a substantially sealed enclosure containing oxygen surrounding said lamp and having a transparent exit window arranged to transmit light from the lamp to another portion of the apparatus, the enclosure being sufficiently large

relative to the lamp so that ozone generated by said light output in the enclosure is circulated in the enclosure and is converted to stable oxygen by the heat of the lamp, and means



for cooling the enclosure [.], *said air cooling means comprising a plurality of outwardly extending heat-radiating fins on the exterior of the enclosure.*

Re. 30,182

PRECODED TERNARY DATA TRANSMISSION

Robert D. Howson, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,679,977, dated Jul. 25, 1972, Ser. No. 835,984, Jun. 24, 1969. Application for reissue Jul. 22, 1974, Ser. No. 490,360

Int. Cl.[2] **D04B** *1/62;* **H04B** *1/66*

U.S. Cl. 325—42 **10 Claims**

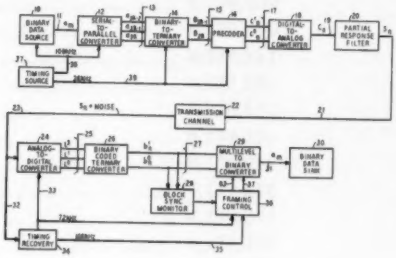
1. Apparatus for communicating a binary data signal over a transmission channel of bandwidth W at an effective binary bit rate that is a nonintegral multiple of the channel symbol rate, comprising

means for mapping each possible first block of binary digits taken m at a time into second blocks of n preassigned N-level digits such that 2^m is less than N^n and there exists at least one unassigned N-level block,

means for precoding N-level digits from said mapping means in accordance with the inverse of the impulse response of said channel such that precoded N-level digits can be decoded from single samples of the received signal,

means for exciting said channel with precoded digits from said precoding means at a signaling rate of 2W symbols per second such that channel signals occupy (2N−1) levels,

means for reconstructing said N-level digits from said channel signals,



means for monitoring N-level digits from said reconstructing means for the presence of said unassigned N-level block therein and producing a framing control signal,

means responsive to said framing control signal for partitioning reconstructed N-level digits into n-length blocks such that said unassigned block does not occur within partitioned blocks to be decoded, and

means under the control of said partitioning means for translating partitioned blocks of N-level digits into a serial train of binary digits.

PATENTS

GRANTED DEC. 25, 1979

ERRATA

For CLASS	See PATENT NO.
433–176	4,179,809
433–075	4,179,810
433–006	4,179,811
433–009	4,179,812
433–079	4,179,813
433–099	4,179,814
433–140	4,179,815
433–161	4,179,816
016–171	4,179,844
410–053	4,179,997
410–064	4,179,998
137–101.25	4,180,083
414–522	4,180,172
406–152	4,180,186
346–075	4,180,225
416–119	4,180,367
416–146 R	4,180,368
422–069	4,180,383
430–394	4,180,402
430–281	4,180,403
430–284	4,180,404
156–185	4,180,413
435–119	4,180,436
435–007	4,180,437
428–402	4,180,489
549–332.2 C	4,180,510
428–417	4,180,514
585–644	4,180,524
585–523	4,180,525
585–719	4,180,526
525–115	4,180,527
525–090	4,180,528
525–085	4,180,529
525–098	4,180,530
525–214	4,180,531

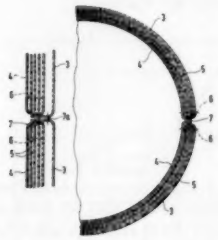
For CLASS	See PATENT NO.
528–112	4,180,607
528–289	4,180,612
525–437	4,180,652
528–391	4,180,653
260–244.4	4,180,668
562–600	4,180,681
250–227	4,180,702
250–237 G	4,180,703
250–237 G	4,180,704
367–007	4,180,790
367–007	4,180,792
367–137	4,180,793
358–016	4,180,825

PATENTS

GRANTED DECEMBER 25, 1979

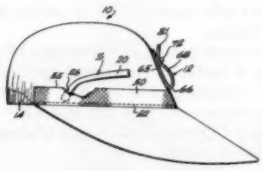
GENERAL AND MECHANICAL

4,179,752
PROTECTIVE SUIT
Peter Fackelmann, Am Haenisgraben 27, Dieburg D-6110, Fed. Rep. of Germany
Filed Feb. 27, 1978, Ser. No. 881,507
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 7708471[U]
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—2 **7 Claims**



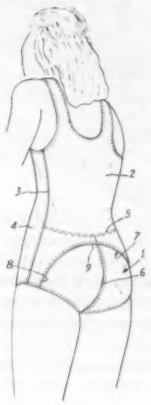
1. A protective suit comprising, in combination, an outer material; a lining; and a plurality of layers of protective material intermediate said outer material and said lining and lying upon each other with a low coefficient of friction between each of the layers, each of said layers having edges, said layers being connected only at their edges to each other and to said lining, said layers each having a high breaking elongation whereby when an individual layer of protective material is stretched after directly contacting a rough surface, another individual layer directly beneath it remains at least substantially unstressed due to the low coefficient of friction at least until the first-mentioned individual layer is worn away.

4,179,753
HEADGEAR WITH EYEGLASS SUPPORT
Sue Aronberg, 1865 NE. 117th Rd., North Miami, Fla. 33161, and Gail Fein, 3165 Pine Tree Dr., Miami Beach, Fla. 33140
Continuation-in-part of Ser. No. 859,836, Dec. 12, 1977, abandoned. Filed Apr. 10, 1978, Ser. No. 894,742
Int. Cl.[2] A42B *1/06*
U.S. Cl. 2—10 **22 Claims**



1. Headgear comprising a band adapted to encircle the head between a brim region and a crown region, the band having a front zone and opposite side zones, all of said zones being above the brim region, receptacle means on the band having an opening at each side zone for receiving corresponding temples of eyeglasses, and clip means on the band at the front zone for receiving and releasably closing about the nose piece of the eyeglasses, the clip means extending upwardly between the brim region and the crown region to encompass the nose piece with the lenses of the eyeglasses arranged upright at opposite sides thereof and with the temples extending rearwardly above the brim region and into the openings, respectively.

4,179,754
COMPETITION SWIMSUIT
Francis Denu, La Walk, France, assignor to ADIDAS, Fabrique de Chaussures de Sport, Landersheim, France
Filed Nov. 25, 1977, Ser. No. 854,679
Int. Cl.[2] A41D *5/00*
U.S. Cl. 2—67 **2 Claims**



1. A competition swimsuit comprising in combination a front part, and a back fastened to the front part along side seams, said back comprising, a lower part extending over the seat of the person wearing the suit, and an upper part extending across and overlapping a portion of said lower part near the waist of the wearer, said upper part and lower part having an unconnected space between them through which air and water can escape from the upper part, and wherein said lower part of the back comprises a panty portion covering the seat of the wearer, having an upper end terminating along the waist, and defining the rear of thigh openings of the suit, and said upper part of the back includes a curved concave lower portion with tips extending to the thigh openings near the side seams.

4,179,755
BELT WITHOUT BUCKLE
Edward J. Clark, Newhall, Calif., assignor to Tandy Brands, Inc., Fort Worth, Tex.
Filed May 30, 1978, Ser. No. 910,200
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—322 **5 Claims**

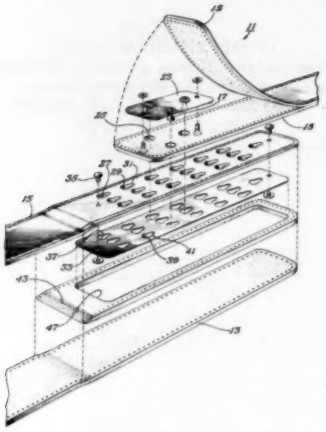
1. An apparel belt having inner and outer plies with improved fastening means for fastening the belt, comprising:

a plurality of pins protruding outward from the outer ply adjacent one end of the belt, each pin having a head and a neck of diameter less than the head;

the inner ply at the other end of the belt having a plurality of apertures positioned so as to mate with the pins to fasten the belt, the apertures being of a size sufficient for receiving the pins;

a metal plate fastened to the inside wall of the inner ply and having a plurality of apertures aligned with the apertures of the inner ply, each aperture of the plate having an enlarged portion of diameter sufficient to receive the head of one of the pins, and an adjoining reduced portion of a diameter sufficient to receive the neck of one of the pins, but not the head, for retaining the pins in the apertures while in the reduced portion, the area of the outer ply

adjacent the apertures in the plate being free of apertures to provide a smooth exterior; and



a spacer interposed between the inner and outer plies at the apertures to provide a clearance between the plate and the inside wall of the outer ply for the heads of the pins.

4,179,756

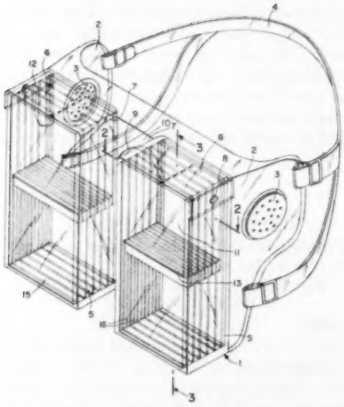
GOGGLES

Charles Lucas, 3769 Dianne St., Bethpage, N.Y. 11714

Filed Jul. 20, 1978, Ser. No. 926,532

Int. Cl.[2] A61F *9/02*

U.S. Cl. 2—434 **4 Claims**



1. An improved pair of goggles for protecting the users eyes from contamination of the type having a frame housing, a plurality of transparent slide down viewing lenses, a plurality of stationary lenses, means to keep contamination from entering the internal sections of the frame housing and lenses and means to keep the goggles on the users head wherein the improvement comprises;

(a) a plurality of guide slots so that the contaminated transparent slide down viewing lenses may be guided downward and out of view of the users view; and

(b) a snap-on cover to permit disassembly and reassembly of the transparent slide down viewing lenses to permit cleaning and replacement of the lenses.

4,179,757

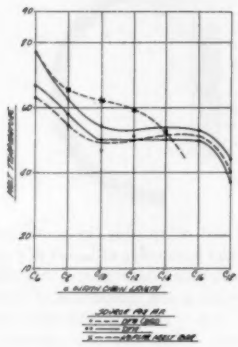
BIOCOMPATIBLE ARTICLES HAVING HIGH PERMEABILITY TO GASES DERIVED FROM POLYSULFONES

James E. Crawford, Adrian, Mich., and Don N. Gray, Sylvania, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 577,533, May 14, 1975, abandoned, which is a division of Ser. No. 328,972, Feb. 2, 1973, Pat. No. 3,928,294, which is a continuation-in-part of Ser. No. 279,877, Aug. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 228,240, Feb. 22, 1972, abandoned. This application May 10, 1976, Ser. No. 684,683

Int. Cl.[2] A61F *1/24, 1/22;* **C08G** *75/22*

U.S. Cl. 3—1 **11 Claims**



1. The new use of a polysulfone polymer, the new use comprising the steps of:

(1) making an article adapted for biomedical surgical implantations of a highly-processable copolymer that is the reaction product of:

(a) an alpha-olefin having about 16 to 18 carbon atoms; and

(b) sulfur dioxide; and

(2) implanting the article of step (1) in a human body as a surgical implant,

said implanted article characterized by its biocompatibility with human blood.

11. An article of manufacture, a surgical implant for use biomedically in the human body and in contact with human blood and characterized by its biocompatibility therewith, said article made of a polysulfone copolymer that is a reaction product of:

(1) an alpha-olefin having 16 to 18 carbon atoms, and

(2) sulfur dioxide,

said surgical implant having a combination of additional properties making it useful in biomedical applications, including good tensile strength and elongation, non-thrombogenicity, oxygen transmission rate of about 1 to 4×10^{-4} CC MIL./IN^2 YR ATM. and a CO_2 transmission rate of about 4 to 17×10^{-4} CC MIL./IN^2 YR ATM.

4,179,758

FIXATION STEM FOR PROSTHETIC DEVICE

Anthony G. Gristina, Winston-Salem, N.C., assignor to Howmedica, Inc., New York, N.Y.

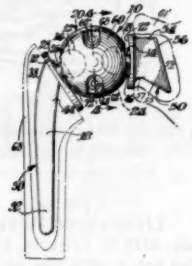
Continuation-in-part of Ser. No. 757,559, Jan. 7, 1977, Pat. No. 4,040,131, which is a continuation-in-part of Ser. No. 681,805, Apr. 29, 1976, Pat. No. 4,003,095. This application Jul. 26, 1977, Ser. No. 819,233

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **3 Claims**

1. A movable prosthetic device adapted for affixation to bony structure having a relatively strong bone plate like region comprising a substantially T-shaped stem, a substantially elon-

gated base incorporated in the stem, a substantially narrow web incorporated in the stem connecting the substantially elongated base to the device, a flange on the device which is spaced from the base of the stem is adapted to be affixed to the bony structure by insertion of the base and web through a hole in the bone plate and into a mass of cement disposed under the



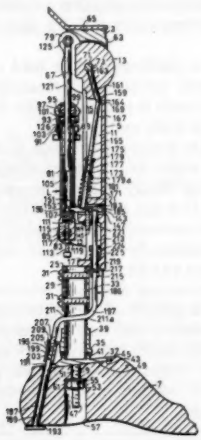
bone plate with the flange disposed in firm contact with the outside of the bone plate, the base is substantially flat, the base is disposed at an acute angle relative to the flange, the flange is substantially oval, the web has longer and shorter sides, and a portion of the longer side disposed adjacent the flange has a cutout to facilitate insertion of the base through the hole in the bone plate.

4,179,759

ARTIFICIAL LEG HAVING A LOCKABLE KNEE JOINT

James A. Smith, 411 S. Glencoe Rd., New Symrna Beach, Fla. 32069

Filed Feb. 16, 1978, Ser. No. 878,612
Int. Cl.[2] A61F *1/04, 1/08*
U.S. Cl. 3—24 **25 Claims**



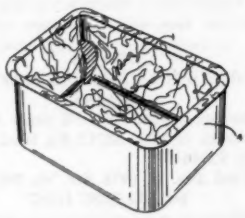
25. An artificial leg comprising an upper limb portion, a lower limb portion, connecting means pivotally connecting the upper limb portion to the lower limb portion, a foot mounted on the lower end of the lower limb portion, locking means responsive to downward pressure on the upper limb portion with the foot resting on a support surface for locking the upper limb portion in position with respect to the lower limb portion, said connecting means comprising pivoting means positioned forward on the center line of gravity in the artificial leg and thereat establishing an axis for monocentric pivotal movements of the limb portions.

4,179,760

MARBLE-PATTERNED BATHTUB, BASIN OR SINK

Yasuharu Nakagawa, Suita, Japan, assignor to Topla, Ltd., Osaka, Japan

Filed Nov. 12, 1975, Ser. No. 631,076
Claims priority, application Japan, Jun. 6, 1975, 50/68979
Int. Cl.[2] A47K *1/04;* **E03C** *1/18;* **B32B** *27/06;* **B44F** *9/04*
U.S. Cl. 4—166 **7 Claims**



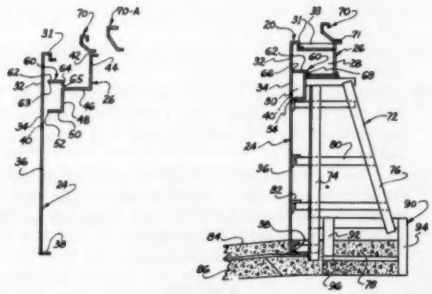
1. A multi-layered article having a thermoformed contoured configuration and the appearance of natural marble which comprises a sheet of molded, transparent acrylic resin having a front side forming the interior surface of the article and a back side with photographic reproduction of marble applied to said back side thereof; a layer comprising an unsaturated polyester resin applied over the exposed side of said photographic reproduction and an outer layer forming an exterior surface of fiber glass reinforced polyester resin applied over said layer of unsaturated polyester resin.

4,179,761

WALL CONSTRUCTION FOR SWIMMING POOLS

John F. Corna, 1542 N. Crest Ave., Columbus, Ohio 43220, and Marcel H. Blais, 8085 Manitou Dr., Westerville, Ohio 43081

Filed Jun. 26, 1978, Ser. No. 918,793
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172.19 **6 Claims**



1. A wall construction for swimming pools comprising, in combination, a plurality of wall forming sections, joined in edge to edge relationship to form the peripheral wall of the pool, each of the sections comprising a first sheet member serially including a horizontally extending top edge portion forming a gutter inlet, an upper first sheet portion, forming a gutter inner wall, an intermediate first sheet portion forming a conduit inner wall, a lower first sheet portion, and a bottom edge portion forming a wall seal portion; a second sheet member serially including a horizontally extending second sheet member serially including a horizontally extending second sheet top edge, a gutter outer wall, a gutter bottom wall, a conduit outer wall, and a horizontally extending second sheet, inner edge joined to the first sheet member at a lower inner welded junction; and a third sheet member serially including a

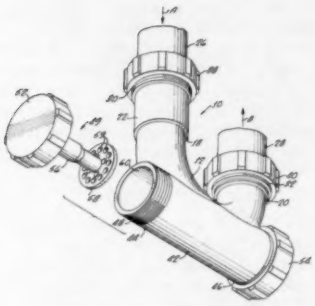
third sheet inner edge joined to the first sheet member at an upper inner welded junction, a horizontally extending third sheet portion forming a conduit top wall for a recirculating conduit and a portion of the gutter bottom wall, and a third sheet outer edge joined to the second sheet member at an upper outer welded junction, said lower and upper inner welded junctions being selectively positionable at various vertical locations on the first sheet member to vary the height of the gutter inner wall and thereby establish the capacity of the gutter.

4,179,762

TRAP AND SOLIDS REMOVAL ASSEMBLY FOR DRAINS

Kenneth O. Barnhardt, 3348 Harvard, Santa Ana, Calif. 92704, and Lawrence H. Morita, 20212 Big Bend La., Huntington Beach, Calif. 92646

Filed Aug. 24, 1978, Ser. No. 936,368
Int. Cl.[2] E03C *1/282*
U.S. Cl. 4—191 **9 Claims**



1. An improved drain trap assembly for use on plumbing lines comprising:
- a generally U-shaped tubular base portion having an inlet side and an outlet side,
- a cylindrical inlet leg integrally connected to the inlet side of said tubular base portion,
- a cylindrical outlet leg integrally connected to the outlet side of said tubular base portion,
- a cylindrical clean-out section, said clean-out section being integrally incorporated in said base portion and having its axis substantially in a common plane with the axis thereof, and
- sealing means for sealing each end of said cylindrical clean-out section, said sealing means at each of said ends being detachable for removal from said clean-out section to permit drainage and cleaning thereof.

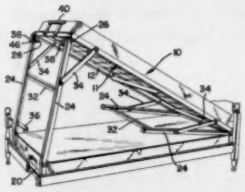
4,179,763

FOLDING BUNK BED UNIT

Luis A. Echavarren, 617 John Marshall Dr., NE., Vienna, Va. 22180, and Daniel Echavarren, 7106 Catlett St., Springfield, Va. 22151

Filed Jun. 23, 1978, Ser. No. 918,460
Int. Cl.[2] A47C *17/40*
U.S. Cl. 5—8 **12 Claims**

1. A folding bunk bed unit comprising a top frame movable between a lower, folded position and an upper, unfolded position, said top frame comprising parallel side rails and end rails; a bottom frame; a plurality of struts each having a free end and having an end which forms a pivotal connection with said bottom frame, said struts extending between said top and bottom frames when said top frame is in the unfolded position, and said free end being the upper end of said strut in the unfolded position and having a top surface that is separated from said top frame in the folded position; and a plurality of link means



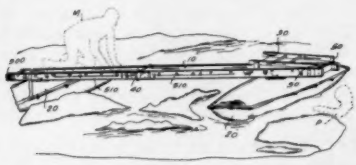
interconnecting said top frame and said struts, said link means forming gussets for said unit in the unfolded position.

4,179,764

LIFESAVING DEVICE

Roy W. Lindblade, 3349 W. 111th St., Chicago, Ill. 60658

Filed Feb. 8, 1978, Ser. No. 876,021
Int. Cl.[2] B63C *9/00*
U.S. Cl. 9—14 **11 Claims**



1. A lifesaving device for use on ice or in water comprising:
- a platform;
- a plurality of inflatable floatation devices each having means for inflation;
- each member of said plurality of inflation devices having means for removably affixing said member to said platform
- such that said platform will be held out of a water or ice einvironment when said floatation devices are placed therein and such that said inflatable floatation devices may be removed from said platform,
- said means for removably affixing including a plate fixedly attached to each said member of said plurality, each said plate having fixedly attached thereto a right angle member with a first and a second portion substantially perpendicular to one another with said first portion being positioned substantially adjacent to and selectively located with respect to said plate;
- said platform having a surface selectively located adjacent said second portion of said right angle member with said platform surface and said second portion each having a hole therethrough, selectively located thereon so that a removable means for linking said platform surface and said second portion rigidly together might be inserted therethrough.

4,179,765

NUTATING DEVICE WITH PROVISION FOR UTILIZATION OF MOTIVE FLUID

Walter D. Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960, and Arthur T. Sempliner, 37-04 Van Nostrand Pl., Douglaston, N.Y. 11363

Continuation-in-part of Ser. No. 827,625, Aug. 25, 1977, which is a continuation-in-part of Ser. No. 848,807, Nov. 7, 1977. This application Mar. 20, 1978, Ser. No. 888,137
Int. Cl.[2] A46B *13/06*
U.S. Cl. 15—22 R **18 Claims**

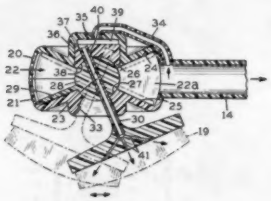
1. In a fluid-driven nutating action appliance including a

motor housing and a wobble plate mounted in said motor housing for universal tilting movement within predetermined limits, means for diverting a portion of the motive fluid to a utilization device, which comprises

(a) an output element carried by said wobble plate,

(b) a utilization device associated with said output element,

(c) flow passage means in said motor housing connected to a remote source of motive fluid and communicating with the interior of said motor housing to drive said wobble plate,



(d) continuous passage-forming means arranged in said output element and said utilization device, and

(e) a plurality of discharge ports arranged in said utilization device,

(f) said passage-forming means communicating at one end thereof with said flow passage means and at the other end thereof with said discharge ports whereby a portion of the motive fluid is diverted through the passage-forming means and discharged through the ports directly to the working surface contacted by said utilization device.

4,179,766

WIPING ARRANGEMENT FOR WIPING A VEHICLE WINDOW

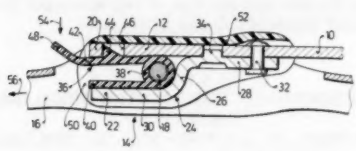
Paul Weiler, Kappelrodeck, and Dietmar Brummer, Buhlertal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 930,980

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2742021

Int. Cl.[2] B60S *1/40*

U.S. Cl. 15—250.32 **17 Claims**



1. A wiping arrangement for wiping a vehicle window, comprising a wiping element; a driven arm element having a forked free end portion which includes two prong sections bounding a gap therebetween and having first surfaces facing toward one another, at least one of said prong sections having a first engaging formation; and connecting means for releasably connecting said wiping element with said arm element, said connecting means including a connecting element which is secured to said wiping element and located in said gap of said end portion of said arm element, said connecting element having two projecting sections which are biased apart from one another and toward said prong sections of said arm element, said projecting sections of said connecting element having second surfaces which face away from one another and each of which abuts against a respective one of said first surfaces of said prong sections of said arm element, at least one of said projecting sections of said connecting element having a second engaging formation arranged for engaging with said first engaging formation of said one prong section of said arm element whereby said connecting element and said wiping element secured thereto become connected with said arm element, said connecting means including a handle portion provided on said one projecting section of said connecting element, said handle portion extending outwardly beyond said prong sections of said arm element and arranged for urging said one projecting section of said connecting element toward the other projecting section thereof so that said engaging formations become disengaged from one another, whereby said connection of said connecting element and said wiping element with said arm element is interrupted and said wiping element can be withdrawn from said arm element without removing the latter from a vehicle window.

4,179,767

WIPING ARRANGEMENT FOR WIPING A VEHICLE WINDOW

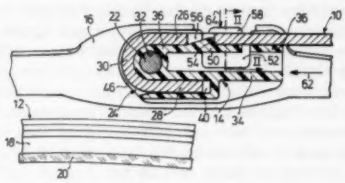
Paul Weiler, Kappelrodeck, and Dietmar Brümmer, Bühlertal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,372

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2742022

Int. Cl.[2] B60S *1/40*

U.S. Cl. 15—250.32 **17 Claims**



1. A wiping arrangement for wiping a vehicle window, comprising a wiping element; a driven arm element having an outer face which faces away from the vehicle window, and a hook-like end part which includes two arm sections connected with one another and bounding a gap therebetween, at least one of said arm sections having a first engaging formation; and a connecting element for releasably connecting said wiping element with said arm element, said connecting element being secured to said wiping element and located in said gap between said arm sections of said end part of said arm element, said connecting element having two projecting portions which are biased apart from one another and a second engaging formation arranged for engaging with said first engaging formation of said one arm section of said arm element whereby said connecting element and said wiping element secured thereto become connected with said arm element, said connecting element further having means for urging said one projecting portion toward the other projecting portion of said connecting element so that said engaging formations become disengaged from one another, whereby said connection of said connecting element and said wiping element with said arm element is interrupted and said wiping element can be withdrawn from said arm element, said means being arranged to be pressed by a user and extending outwardly beyond said outer face of said arm element in a direction away from the vehicle window and is not obstructed from outside, so that said means can be pressed by a user from outside at a side opposite to the vehicle window and thereby the withdrawal of said wiping element from said arm element can be performed without removing the latter from the vehicle window.

4,179,768

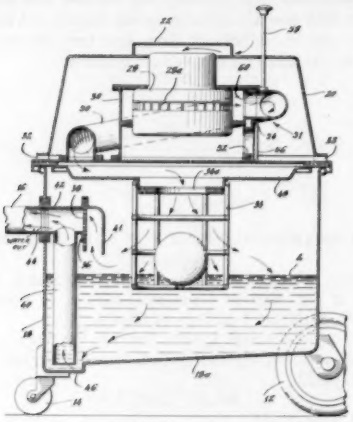
VACUUM DUMPING ARRANGEMENT FOR A WET/DRY VACUUM CLEANER

Roderick Sawyer, Elkhart, Ind., assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation of Ser. No. 777,959, Mar. 16, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,367

Int. Cl.[2] A47L *7/00*

U.S. Cl. 15—352 **7 Claims**



1. A wet/dry vacuum cleaner having a suction mode and a fluid pressurizing mode resulting in air and liquid discharge respectively comprising: a tank provided with an aperture and having an intake hose, a cover for said tank, one end of said hose being connected to said aperture for communication with the interior of said tank, a fan-motor, a separate enclosure for said fan-motor, said enclosure being provided with two spaced openings each of which are fluidly connected to one of the suction or pressure sides of said fan, one of said openings connecting the space between said cover and the enclosure of said fan-motor with the suction side of said fan, a flexible tube communicating said tank with either one of said openings, shifting means for one end of said tube from a connection to one of said openings to a connection to the other of said openings, said flexible tube being continually connected to at least one of said openings, the suction side of said fan having a suction level that can be controlled by misaligning the end of said flexible tube and suction opening to permit air from the space between the cover and enclosure to be bled into said fan, the pressure side of said fan being controlled by misaligning the end of said flexible tube and the discharge opening for controlling the discharge rate of the liquid discharge, said cover spaced from and surrounding said fan-motor enclosure, the latter having said internal space for said fan-motor, said cover also enclosing said shifting means and said flexible tube, vent means in said cover for permitting fluid communication between the atmosphere and said space; the suction mode having air which passes through said flexible tube, through the opening on the suction side of said fan, and through said vent means to the atmosphere; a liquid evacuating means connected to said intake hose, said liquid evacuating means having a pipe provided with one end connected to said intake hose and the other end being free and arranged to be submerged in the liquid solution accumulated in said tank and closely adjacent to the bottom of said tank, a one-way valve in said tank communicating with said intake hose; the fluid pressurizing mode having said flexible tube communicating with the other of said openings whereby air in the space between the cover and enclosure enters the suction side of the fan and passes through the pressure side of said fan, said flexible tube, and to said tank to close said one-way valve thus causing said air in the tank to be pressurized to an extent to pump the liquid solution in said tank out of said pipe and intake hose while said one-way valve is maintained in the closed condition.

4,179,769

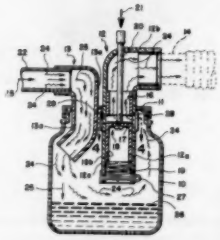
VACUUM CLEANER ATTACHMENT FOR VACUUMING LIQUIDS

Robert H. Lundquist, 1850 N. 500 East, Provo, Utah 84601

Filed Oct. 19, 1978, Ser. No. 952,640

Int. Cl.[2] A47L *7/00*

U.S. Cl. 15—353 **4 Claims**



1. A portable attachment for vacuum cleaners which permits pickup of liquids as well as solids with the aspirated air, said attachment comprising:

a portable container;

a removable cover on said container, said cover making a substantially air-tight connection with said container;

a pair of nozzles on said cover, said nozzles providing fluid flow communication between the inside and outside of said container;

means for attaching the suction hose of a vacuum cleaner to the first nozzle of said pair of nozzles;

valve means in combination with said first nozzle, said valve means being spring biased in the closed position so that fluid flow communication between the inside of said container and the suction hose of the vacuum cleaner is established only when the valve means is activated to its open position;

a scavenger hose adapted to convey a mixture of air and liquids; and

means for attaching one end of said scavenger hose to the second nozzle of said pair of nozzles.

4,179,770

TURF GROOMING VEHICLE WITH DISCHARGEABLE RECEIVER

John F. Nunes, Jr., c/o Nunes Mfg. Co., 2006 Loquot Ave., Patterson, Calif. 95363

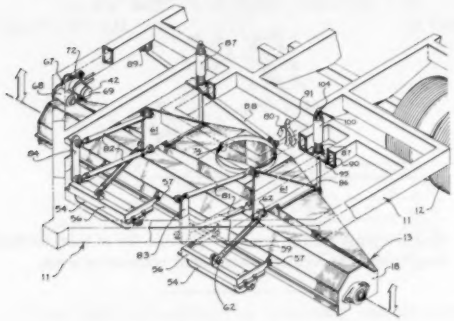
Division of Ser. No. 703,632, Jul. 8, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,657

Int. Cl.[2] A47L *5/30*

U.S. Cl. 15—360 **1 Claim**

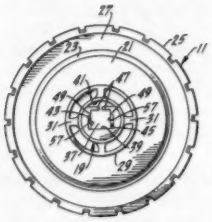
1. In a turf grooming vehicle, a mobile chassis of a type adapted to be moved across a field of turf, wheels supporting said chassis to cause said chassis to rise and fall in terrain-following movement with the vertical movement of the wheels, grooming means including a vacuum head assembly including vacuum means serving to apply vacuum to the turf for removing loose turf material therefrom, said assembly including means supporting said vacuum means to rise and fall in terrain-following movement substantially unaffected by the vehicle movements of said wheels while maintaining said vacuum means substantially at a predetermined spaced relation to said turf, said head assembly being coupled to be drawn by said chassis, said means supporting said vacuum means comprises rollers carried by said head assembly for engaging the turf and supporting said vacuum means in spaced relation therefrom, and means for adjusting the clearance of said vacuum means

with respect to the turf comprising U-shaped mounting yokes carrying said rollers to roll in supporting engagement across the turf, the ends of said yokes being pivoted to said head



assembly, and a turn-buckle extending between said assembly and a portion of said yoke for adjusting the clearance beneath said head assembly.

4,179,771
KNOB
Paul Rankins, and Robert K. Howie, Jr., both of Decatur, Ill., assignors to The Grigoleit Company, Decatur, Ill.
Filed Mar. 13, 1978, Ser. No. 885,681
Int. Cl.[2] F16D *1/06*
U.S. Cl. 16—121 **5 Claims**



1. A molded knob of the type which frictionally engages and slips over the end of a shaft,

a hub formed as part of said knob,

a shaft receiving socket formed in said hub,

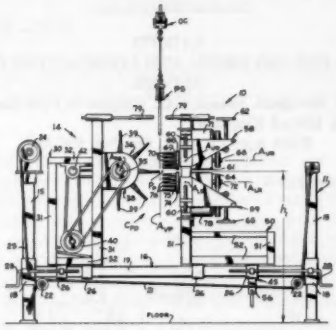
said socket having a flat wall adapted to engage a flat on said shaft,

elongated fingers formed as part of said hub and extending into said socket on the opposite side of said socket from said flat wall,

said fingers extending towards and in alignment with each other and being laterally deflectable in a direction away from said flat wall upon insertion of said shaft into said socket, and

at least one abutment formed as part of said hub and adapted to limit further deflection of said fingers beyond that caused by the insertion of said shaft into said socket, specifically when said further deflection is due to the application of torque to the shaft.

4,179,772
DRUM/DISK POULTRY PICKER
Grover S. Harben, Jr., Edgewater Ave., Gainesville, Ga. 30501
Filed Feb. 3, 1978, Ser. No. 874,844
Int. Cl.[2] A22C *21/02*
U.S. Cl. 17—47 **9 Claims**



1. A poultry picking machine through which poultry are conveyed successively along a picking path in a head lowermost position so that the poultry is suspended along a generally vertical axis and the vertical axis moves with the poultry along a generally vertical picking plane along the picking path comprising:

a disk type picking arrangement including a plurality of disk support members disposed along and adjacent one side of the picking path and the vertical picking plane, each of said disk support members rotating about disk axes oriented generally normal to said path; and a plurality of flexible disk picking fingers mounted on each of said disk support members and projecting toward said picking path so that said flexible picking fingers are rotated with said disk support members in circular paths concentric about said disk axes to engage and defeather poultry successively moving along said picking path; and

a drum type picking arrangement including a plurality of drum support members disposed along and adjacent the picking path on the opposite side of the vertical picking plane from said disk type picking arrangement, said drum support members rotating about a common drum axis generally parallel to and spaced outwardly of the picking path; and a plurality of flexible drum picking fingers mounted on each of said drum support members and movable with said drum support members about said common drum axis in a plane generally normal to the picking path and the vertical picking plane to engage the poultry in opposition to said disk picking fingers to defeather poultry passing along said picking path.

8. A method of defeathering poultry comprising the steps of:

successively conveying poultry along a picking path in a head lowermost position so that the poultry is suspended along a generally vertical axis and the vertical axis moves with the poultry along a generally vertical picking plane along the picking path;

engaging the poultry from one side of the picking path and the vertical picking plane with a plurality of sets of first resilient picking fingers rotating about a common rotational axis generally parallel to the picking path with each set of the first resilient picking fingers circumferentially spaced about and radially oriented with respect to the common rotational axis and with the sets of the first picking fingers axially spaced along the common rotational axis; and

simultaneously engaging the poultry from the opposite side of the picking path and the vertical picking plane in opposition to the first picking fingers across the vertical picking plane with a plurality of sets of second resilient picking

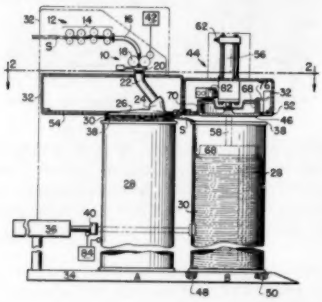
fingers rotating about a plurality of separate rotational axes axially spaced along the picking path and oriented generally normal to the picking path with each set of the second picking fingers arranged in a concentric circle about one of said separate rotational axes and with the second picking fingers in each set oriented generally parallel to the separate rotational axis.

4,179,773

MEANS FOR SEVERING AND COMPACTING COILED SLIVER

Richard J. Savageau, Seneca, S.C., assignor to Platt Saco Lowell Limited, United Kingdom

Filed Apr. 27, 1978, Ser. No. 900,559
Int. Cl.[2] D65H *54/84*
U.S. Cl. 19—159 A **5 Claims**



1. In combination with a conjoined coiler apparatus and an automatic can changer apparatus, respectively for filling a can with a strand of coiled sliver and for the replacement of said then-filled can with an empty one, means for compacting coils of said sliver strand within said filled can and for concurrently causing the parting in two through attenuation of that portion of said strand extending between said filled can and said coiler apparatus, said means including a compactor plate which is extendible into said filled can to compact said coils and is then withdrawable therefrom, and means for controlling and coordinating the said elements of the here-defined combination for their sequential and automatically repetitive operation in cycles of can filling, can changing, sliver compacting and sliver parting, said control means including

means for controlling the movement of said compactor plate within and above said filled can at a prescribable rate whereby expulsion of air from said sliver coils in turn is at a rate which precludes disruption of said sliver.

4,179,774

CABLE CLAMPS

Stanley A. Bradbury, London, England, assignor to Cable Supports Limited, Great Britain

Filed Jun. 22, 1978, Ser. No. 917,971
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—132 R **9 Claims**

1. A cable clamp having:

a base member;

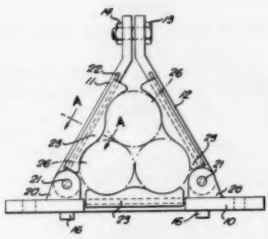
two arms, each defining two longitudinal grooves, one in each side edge of the respective arms;

first means for mounting one of the arms at one end thereof at a first location on said base member;

second means for mounting the other of the arms at one end thereof at a second location on said base member, said second location being spaced from said first location and at least one of the arms being pivotally attached to the base member;

means for securing the other ends of the arms together; and

a pad for each of said arms and base member for gripping a cable or group of cables in the region between the arms and base, each of the pads for the arms having projections for engaging in the grooves of their respective arms so



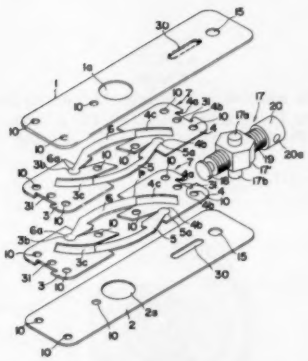
that the pads for the arms are slidable for at least limited longitudinal movement along their respective arms.

4,179,775

ADJUSTABLE CLAMPING DEVICE

Susumu Fujita, Kobe, Japan, assignor to Nittan Kohki Co., Ltd., Sakai, Japan

Filed Jul. 6, 1978, Ser. No. 922,424
Claims priority, application Japan, Jul. 11, 1977, 52-83232; Oct. 7, 1977, 52-121292
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—249 R **8 Claims**



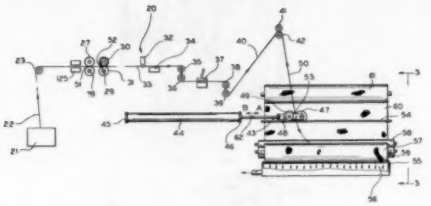
1. An adjustable clamping device for clamping a pipe or the like through peripheral clamping engagement, which comprises a first fixed slide member having first slot and a second slot, said first slide member having a first clamping portion between said first slot and said second slot, a second slide member having a third slot and a fourth slot, said second slide member having a second clamping portion between said third and said fourth slot, a pair of said third and said fourth slots being coplanar with a pair of said first and said second slots, a third slide member having a slide portion at one longitudinal end thereof slidably received in said second slot and a portion at the other longitudinal end thereof fitted in said fourth slot, said third slide member having a third clamping portion between said one end and said other end thereof, a fourth slide member having a slide portion at one longitudinal end thereof slidably received in said third slot and a portion at the other longitudinal end thereof fitted in said first slot, said fourth slide member having a fourth clamping portion between said one end and said other end thereof, means for mounting said first to fourth members for variable spacing therebetween along a preselected line of movement, and means for forcibly effecting relative movement of said first and second members toward each other along said line of movement.

4,179,776

METHOD AND APPARATUS FOR DEREGISTERING AND PROCESSING AN OPEN SYNTHETIC TOW INTO FIBER-FILLED ARTICLES

Harold Wortman, 5936 Monroe St., Morton Grove, Ill. 60053

Filed Sep. 19, 1977, Ser. No. 834,176
Int. Cl.[2] B65D 75/00; D04H 3/00; D02J 1/18
U.S. Cl. 28—121 11 Claims



1. An improved method for producing and processing deregistered and disorientated synthetic tow for inclusion into fiber filled articles, said method comprising the steps of:

A. Feeding a substantially narrow crimped registered tow bundle into a nip formed between a first pair of rolls, each one of said first pair of rolls rotating oppositely to one another at a first speed so as to draw said tow bundle through and between said rolls, at least one of said first pair of rolls having smooth surfaces;

B. Deregistering said crimped registered tow by drawing said tow bundle from the back side of said first pair of rolls into a nip of a second pair of rolls, each one of said second pair of rolls rotating oppositely to one another at a second speed greater than said first speed, at least one of said second pair of rolls having a noncontinuous groove-threaded surface, thereby spreading the tow bundle outwardly into a wider configuration;

C. Dispersing and spreading said tow as it is processed at a position proximate to said first and second pair of rolls thereby additionally shaping said tow into a substantially dispersed web;

D. Collecting said dispersed and spread web for distribution into said fiber filled articles;

E. Distributing said web of disorientated and deregistered synthetic tow for envelopment into said fiber filled article;

F. Preliminarily enveloping said web of disorientated and deregistered synthetic tow between a plurality of article surface materials, said enveloping being accomplished through the steps of:

1. Depositing said collected web material directly onto the first layer of article surface material by cross-lapping said web material in a reciprocating motion onto said first layer of material as said first layer of material is drawn in a direction substantially normal to the direction of said reciprocating motion;

2. Attracting said deposited web into close compacted position on said first layer of surface material through vacuum suction means located directly below said first layer of article surface material;

3. Guiding said first layer of surface material and said deposited tow web in said direction into communication with a second layer of article surface material thereby sandwiching said tow web between said first and second layers of surface material; and

4. Guiding said sandwiched web and surface materials into means for attaching said first and second layers to one another for enclosing said deposited tow web between said first and second layers of surface material; and

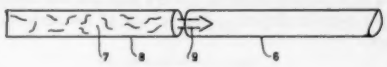
G. Finishing the fabrication of said fiber filled articles by enclosing and affixing said enveloped web between said plurality of article surface materials through the use of article attachment means comprising stitching and sewing.

4,179,777

METHOD OF PRODUCING A LOW-PRESSURE GAS DISCHARGE LAMP

Jan Hasker, and Cornelis Peters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 765,935
Claims priority, application Netherlands, Mar. 30, 1976, 7603285
Int. Cl.[2] H01J 9/18
U.S. Cl. 29—25.13 7 Claims



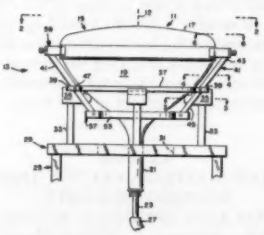
1. A method for producing a low-pressure gas discharge lamp having two electrodes which comprises: providing an elongated envelope; providing a quantity of thinly distributed filament wool; then preparing said filament wool into a mat having a length equal to or smaller than the distance between the electrodes; then rolling said mat to form a generally cylindrical member having an outer diameter substantially equal to the inner diameter of said envelope and a length substantially equal to the length of the mat; and then introducing said member into the elongated envelope to provide a substantially uniform distribution of said wool within essentially all of said envelope; said introducing step including the use of a gas stream.

4,179,778

MEANS FOR MINIMIZING PROCESSING IMPLOSIONS IN CRT MANUFACTURE

Robert M. Corson, Ottawa, Ohio, assignor to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 865,409, Dec. 29, 1977, Pat. No. 4,152,036. This application Nov. 22, 1978, Ser. No. 963,071
Int. Cl.[2] H01J 9/24
U.S. Cl. 29—25.19 7 Claims



1. Means for applying external pressure to discrete peripheral areas of the panel portion of a cathode ray tube envelope in a manner substantially normal to the longitudinal axis thereof during ambient heat processing, said envelope being formed as an integration of panel, funnel and neck portions, said pressure application means being a device formed to spatially encompass portions of said tube envelope comprising: a plurality of spaced-apart support means fashioned to provide support seating for the funnel portion of said tube envelope, said support means being in a plane substantially normal to said axis; a first closed ring-like member fabricated of a material exhibiting a low coefficient of linear thermal expansion and oriented to rest upon said support means, said first member having a perimetric dimension greater than that of said funnel portion at the region of support, said first member having a plurality of spaced-apart pivot means located on the periphery thereof; a plurality of lever arms formed of low-expansive material and related in an angular manner with said first member, each of said arms having an upper and lower end with a respective attachment element thereat and a pivot point there-

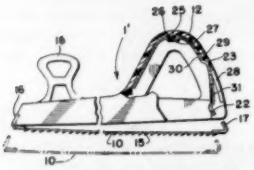
between, each of said pivot points being associated with a respective pivot means on said first member; a second closed ring-like member fabricated of a material exhibiting a high coefficient of linear thermal expansion and formed to have a perimetric dimension smaller than that of said first member, said second member having a plurality of spaced apart attachment means peripherally formed thereon to effect movable jointure affixation with the lower attachment elements of the respective lever arms; and a plurality of spaced-apart contact heads each being movably affixed to the upper attachment elements of the respective lever arms, each of said heads having a face portion oriented toward said axis and being formed with a contour shaped to fit a portion of the periphery of said panel.

4,179,779

HAND PLANE

Robert R. Hayes, Euclid, Ohio, assignor to Oatey Co., Cleveland, Ohio

Filed Aug. 14, 1978, Ser. No. 933,509
Int. Cl.[2] B23D *71/00, 71/04;* **B24D** *15/04*
U.S. Cl. 29—78 **12 Claims**



1. A planing tool comprising an elongated frame for supporting an elongated planer blade, said frame having a top wall and a pair of laterally spaced downwardly extending side walls, a beveled face at the forward end of said frame between said side walls for hooking engagement by a first mounting tab on the forward end of the blade, a handle extending upwardly adjacent the rear end of said frame, a recess in the rear end of said frame adapted to receive a second mounting tab on the rear end of the blade, and spring latch means adjacent the rear end of said frame for releasably engaging the second mounting tab and urging such second mounting tab rearwardly for securely retaining the blade on the bottom of said frame.

4,179,780

METHOD OF MAKING A CLUTCH THROW-OUT BEARING ASSEMBLY

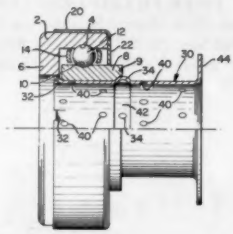
Eli M. Ladin, Ann Arbor, and Mark P. Reynolds, Birmingham, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

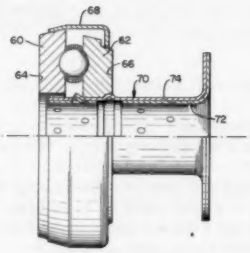
Division of Ser. No. 711,753, Aug. 4, 1976, Pat. No. 4,117,917. This application Jun. 15, 1978, Ser. No. 915,698
Int. Cl.[2] B21D *53/10*
U.S. Cl. 29—149.5 R **4 Claims**

1. A method of making a clutch throw-out bearing assembly which includes an antifriction bearing with a bearing carrier inserted telescopically into the bore thereof and securing said bearing carrier to said antifriction bearing by staking or the like, the improvement comprising,

stamping said bearing carrier as a single unit from flat sheet metal stock including the steps of providing a flat sheet metal stock, embossing said flat sheet metal stock with a plurality of recesses on one face thereof, die-forming said sheet metal stock to impart at least one protuberance projecting from the other surface thereof, forming said flat sheet metal stock into a generally cylindrical tube with the embossed said one face defining the internal surface of said tube,

forming a radial flange on said tube by upsetting one end of said tube, slidably inserting the other end of said tube into the bore of said antifriction bearing in axial abutting contact with said protuberance and thereafter securing





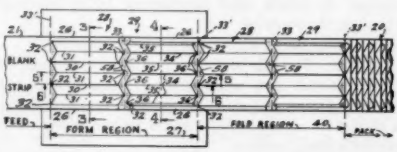
said bearing on said tube forming a clutch throw-out bearing assembly.

4,179,781

METHOD FOR FORMING A HEAT EXCHANGER CORE

Wesley A. Long, Sylvania, Ohio, assignor to Karen L. Beckmann, Toledo, Ohio

Continuation-in-part of Ser. No. 708,575, Jul. 26, 1976, Pat. No. 4,131,159. This application Sep. 16, 1977, Ser. No. 833,718
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 R **4 Claims**

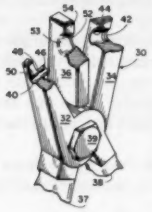


1. A method for forming a core for an indirect fluid-to-fluid heat exchanger comprising the steps of: forming an elongated sheet of metal to define a longitudinal series of closely spaced corrugated sections each having a plurality of parallel corrugations defining ridges and troughs terminating in triangular end reinforcements, such reinforcements having apexes, the apexes of the end reinforcements at the end of each section lying substantially along a line extending in a direction transverse to the elongated sheet; pleat folding said formed sheet along such lines between adjacent sections whereby alternating first and second fluid passages are defined by said folded sheet with said first passages lying on one side of said sheet and said second passages lying on the other side of said sheet; and sealing together adjacent edges of said sections to enclose ends of said first passages.

4,179,782
CABLE TERMINAL-FERRULE ATTACHING APPARATUS

Donald B. Forman, and Phillip Bradshaw, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1978, Ser. No. 902,013
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—268 **9 Claims**



1. Compression apparatus for connecting a snap ring between a pair of members, one member having a pair of spaced outer annular shoulders forming an outer groove and the other member being a ferrule having an annular bore groove, the snap ring being adapted to be positioned within said grooves comprising:

a pair of first and second jaws movably mounted together for compression of said members therebetween;

said first jaw having an opening extending therethrough for seating one of said members;

said second jaw having an opening extending therethrough for receiving the other said member;

said first jaw having a projecting portion coextensive with its respective opening for applying a pressure against said one member;

a third jaw positioned between said pair of jaws and having an opening extending therethrough of a size for receiving said first member;

the openings in said first, second, and third jaws being in longitudinal alignment;

means on said third jaw for radially compressing inwardly the snap ring;

whereby compression of the first and second jaws together will cause the snap ring to be cammed radially inwardly and positioned between the spaced terminal shoulders of said one member allowing said one member to be inserted into the said second member until the snap ring is captured between the grooves in the two members rotatably to secure them together.

4,179,783
HOLDING APPARATUS WITH ELASTIC MECHANISM

Tadao Inoyama, Yokohama; Yasuhide Matsumura, Hachioji, and Yukio Nagano, Chiba, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 640,702, Dec. 15, 1975, abandoned. This application Sep. 20, 1977, Ser. No. 834,897
Claims priority, application Japan, Dec. 16, 1974, 49/143413
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—281.5 **18 Claims**

1. A holding apparatus comprising:

(a) a holding mechanism for holding an assembly member;

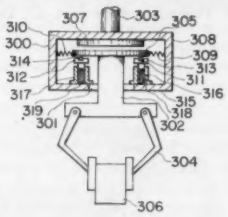
(b) a drive shaft and support means fixed to said drive shaft for resiliently supporting said holding mechanism, said support means including:

supporting structure,

axial coupling means for resiliently coupling said holding mechanism to said supporting structure in the axial direction of said drive shaft,

transverse coupling means including resilient means for resiliently coupling said holding mechanism to said supporting structure in a direction transverse to said axial direction,

first resilient means forming part of said axial coupling for enabling resilient displacement of said holding mechanism, and



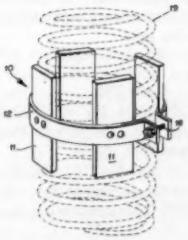
second means, forming part of said axial coupling between said holding mechanism and said first means, for minimizing operational interference between said transverse coupling and said first means; and

(c) detector means provided on said support means for detecting deflection of said holding mechanism relative to said drive shaft.

4,179,784
TOOL FOR INSTALLING VEHICULAR COIL SPRINGS

Florien J. Warren, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg. 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 25, 1977, Ser. No. 762,316
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 29—283 **2 Claims**



1. A tool for reinforcing compression coil springs during installation between opposite seats, the combination of a plurality of parallel spaced longitudinal plates, and a transverse flexible metal band having an inner surface, said plates being rigidly affixed at right angles to said inner surface of said band whereby said band fully circumscribes said plates when bent into curvate form including integral opposite ends of said bands extending outwardly at right angles to said band forming opposing spaced tabs, aligned openings through said tabs, a bolt adapted to fit through said openings when said tool is mounted around a compression coil spring periphery, said bolt including a nut mounted on said bolt engaging a tab thereby retaining the band in a curvate position with said plates engaging compressively said spring, thus preventing bulging of said spring.

4,179,785

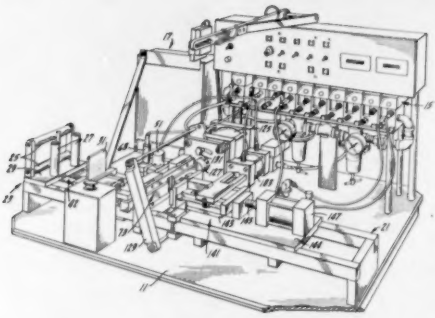
TERMINAL FORMING AND INSTALLING APPARATUS

Maurice H. Brown, 11655 S. Mayfield, Worth, Ill. 60482

Division of Ser. No. 849,848, Nov. 9, 1977, Pat. No. 4,148,237, which is a continuation-in-part of Ser. No. 738,639, Nov. 3, 1976, Pat. No. 4,068,367. This application Nov. 27, 1978, Ser. No. 963,914

Int. Cl.[2] B23D *23/00*

U.S. Cl. 29—33 K 4 Claims



1. A wire shearing mechanism for forming at least one terminal from an elongated length of wire, said shearing mechanism including:

a blade having at least one wire passage formed therein,

a slidable insert having at least one wire passage formed therein and aligned with said wire passage in said blade in at least one position of said blade,

a face plate having at least one wire passage formed therein and aligned with said wire passages in said blade and said sliding insert in at least one aligned position of said blade and said sliding insert,

said blade being mounted for sliding movement relative to said slidable insert to sever at least one length of wire extending through said blade, said sliding insert and said face plate to form at least one wire terminal, and

means to slide said slidable insert relative to said front plate after the wire terminal is withdrawn from said slidable insert to enable said slidable insert to function as a backing member for said terminal during embedding of said seated terminal in said plastic part.

4,179,786

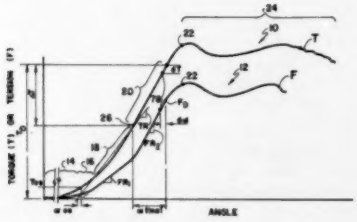
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Jun. 2, 1978, Ser. No. 912,151

Int. Cl.[2] B23P *19/06*

U.S. Cl. 29—407 44 Claims



1. Apparatus for tightening seriatim a multiplicity of substantially identical joints having components including at least one threaded fastener to substantially the same final desired stress value, below the yield point of any component that can be correlated with stress, appearing in the fastener, comp ising

a powered instructable tool, capable of terminating tightening in response to an instruction which varies from one fastener to the next, for applying torque to the fastener and tightening the same;

means for sensing the torque applied to the fastener at various angles of advance;

means responsive to the torque and angle sensings for determining, while tightening below the yield point of any joint component that can be correlated with stress, a tightening parameter value, variable from one fastener to the next, sufficient to tighten each fastener to the final desired stress value; and

means for instructing the tool to terminate tightening of each fastener in response to the determined tightening parameter value.

4,179,787

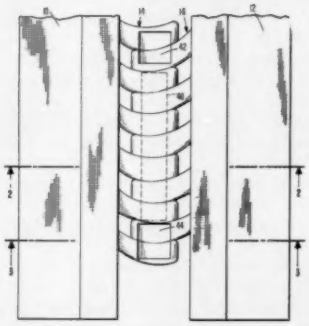
METHOD OF FORMING A BOTTOM STOP ON A SLIDE FASTENER

Norman W. MacFee, Conneaut Lake, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 752,825, Dec. 20, 1976, Pat. No. 4,091,509. This application Apr. 12, 1978, Ser. No. 895,672

Int. Cl.[2] B21D *53/56;* B29D *5/00*

U.S. Cl. 29—408 3 Claims



1. A method of forming a bottom stop on a slide fastener which has meshing convolutions of a pair of coil coupling elements at the bottom thereof with portions of the central openings of the bottoms of both coil elements being in alignment, the method comprising the steps of

inserting an elongated member into the aligned portions of the central openings of both coil elements at the bottom of the slide fastener, and

deforming at least one convolution of the coil elements into said central openings so as to secure the elongated member in the aligned portions of the central openings.

4,179,788

METHOD OF FABRICATING A BUILDING

Gerald A. Kragt, Marne, Mich., assignor to Jer Manufacturing, Inc., Coopersville, Mich.

Division of Ser. No. 853,104, Nov. 21, 1977, Pat. No. 4,115,967. This application Jul. 21, 1978, Ser. No. 926,806

Int. Cl.[2] B23P *21/00;* B23Q *3/00*

U.S. Cl. 29—407 3 Claims

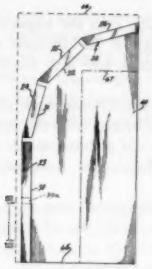
1. A method of fabricating a building having a pair of end panels connected by purlins for supporting roof panels, said method including the steps of:

placing a templet on a building panel, said templet defining

a silhouette on said building panel of at least a portion of the end panel of the building and also defining the position of purlins to be secured to said panels;

tracing the outline of said templet on said building panel thereby defining said silhouette and also indicating the placement of the abutting ends of a plurality of purlins to be extended between the end panels on the building panel;

cutting the traced silhouette of the end panel from the building panel while retaining the definition of the position of the placement of said ends of said purlins,



attaching raised guide means to the building panel, said guide means being positioned in accordance with the said definition thereby being spaced from one another so that the indicated placement of the abutting purlin ends is established,

extending purlins between the end panels; and

attaching the purlins to the end panels at a position between said guide means; and

attaching the roof panels to adjacent purlins and between aligned guide means on opposing end panels of the building.

4,179,789

PROCESS FOR PRODUCING A PISTON-TYPE SAFETY LOCK DEVICE

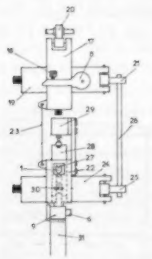
Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Division of Ser. No. 767,584, Feb. 10, 1977, abandoned. This application Nov. 2, 1977, Ser. No. 847,955

Claims priority, application France, Mar. 1, 1976, 76 05707

Int. Cl.[2] B23P *15/00;* **E05B** *29/04*

U.S. Cl. 29—412 **2 Claims**



1. A process for producing a piston-type safety lock device of the type comprising a cylindrical rotor journalled in a cavity of a stator, said rotor containing a plurality of radially slidable pistons cooperating at their inner ends with the notches of a key for bringing their other ends flush with the periphery of said rotor, said other ends bearing against the inner surface of the cavity in which the rotor is journalled and, for one angular position of the rotor, against pistons slidable in the stator and elastically biased toward the rotor, the sum of the length of the piston in said rotor and that of a piston slidable in said stator with which said piston of said rotor cooperates in said one angular position, being a constant, and said two pistons constituting a matched pair of pistons wherein each said pair of pistons of the stator and rotor are formed from a single flat blanked member and said pistons are disposed respectively in a single slot of the stator and in a single slot of the rotor and have rectilinear and parallel lateral edges which are in contact with the lateral edges of an adjacent piston or with the end of said slot, said process comprising feeding a single flat blanked member relative to a device for blanking a flat blanked member by a displacement related to the depth of the notches to be made in the key notching said key, blanking said single flat blanked member to form a pair of pistons the lengths of which are in direct relation to the depth of the corresponding notch of the key and the sums of the lengths of which are equal to said constant, feeding said pistons into a stator and a rotor of a lock device, each of which is provided with a receiving slot, repeating the operation as many times as the key has notches, placing return springs for said pistons in position and mounting retaining means for said pistons.

4,179,790

PROCESS OF MANUFACTURING A WALL HAVING AN OPENING THEREIN, AND A DOOR OR COVER THEREFOR

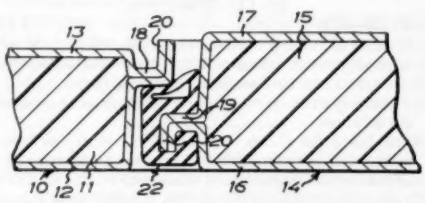
Gosta T. I. Tornerfelt, Ljungby, Sweden, assignor to AB Trelleborgplast, Ljungby, Sweden

Filed Jun. 15, 1978, Ser. No. 915,696

Claims priority, application Sweden, Jun. 23, 1977, 7707315

Int. Cl.[2] B23P *17/00;* **B29D** *3/02, 9/00;* **B29G** *3/00*

U.S. Cl. 29—416 **7 Claims**



1. A process for making a wall (**10**) with an opening therein, and a closure (**14**) for the opening which is larger than the opening, comprising the steps of forming the wall (**10**) and the closure as one piece in a common tool, said forming step forming the wall and closure in laterally offset relationship so they lie in different planes; forming during said forming step a connecting flange (**20**) between an inner edge of the wall opening and an outer edge of the closure, said flange extending substantially transversely of said different planes, and severing the closure (**14**) from the wall (**10**) by cutting (at **21**) intermediate the connecting flange (**20**).

4,179,791

VARIABLE FIT FASTENER

Floyd G. Speraw, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 2, 1977, Ser. No. 856,823

Int. Cl.[2] F16B *19/00*

U.S. Cl. 29—526 R **22 Claims**

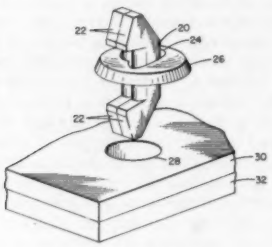
1. A method of detachably fastening two co-planar work pieces together having mutually aligned apertures comprising the steps of:

folding an elastic fastener member having oppositely disposed engaging surfaces on itself along the long axis of the fastener member;

slidably mounting a ring member having a plurality of locking surfaces located therein on the elongated fastener member;

inserting the folded fastener member through said apertures to position said retainer ring between one work piece and one of said engaging surfaces; and

unfolding the fastener member to position opposite edges of



the fastener member within one of said locking surfaces of said ring member positioning the fastener member in one of a plurality of unfolded positions to lock the fastener member and the ring member in a fastening position with said work pieces.

4,179,792

LOW TEMPERATURE CMOS/SOS PROCESS USING DRY PRESSURE OXIDATION

Sidney Marshall, and Robert J. Zeto, both of Monmouth County, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1978, Ser. No. 894,784

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **1 Claim**

1. Method of making enhancement type, self-aligned silicon gate complementary metal oxide semiconductor/silicon on sapphire structures, said method consisting of:

(A) cleaning a silicon on sapphire substrate in an acid cleaning solution,

(B) oxidizing the silicon layer at 850° C. in dry oxygen at a pressure of one atmosphere to provide a silicon oxide film of 100 to 300 angstroms in thickness,

(C) depositing a silicon nitride film of about 1000 angstroms on the silicon oxide layer at a temperature of 700° C. to 750° C.,

(D) applying a layer of photoresist to the layer of silicon nitride and defining a pattern in the layer of photoresist,

(E) selectively etching the layer of silicon nitride in an RF generated plasma containing a fluorine species,

(F) removing the layer of photoresist in an oxygen plasma,

(G) oxidizing the silicon layer with dry oxygen under a pressure of about 500 atmospheres and at a temperature of about 825° C. to form islands of silicon isolated from one another by silicon oxide,

(H) removing the layer of silicon nitride in an RF generated plasma containing a fluorine species,

(I) removing the oxide film formed in (B) with hydrofluoric acid solution,

(J) recleaning the substrate with an acid cleaning solution,

(K) applying a layer of photoresist over the substrate and then removing the photoresist from selected islands of silicon,

(L) implanting boron into the exposed islands of silicon at 240 kilovolts at a dose rate of about one to 5×10^{11} atoms/cm^2,

(M) removing the photoresist in an oxygen plasma,

(N) annealing the substrate in dry oxygen at 900° C. for 60 minutes,

(O) cleaning the substrate with a gate oxide cleaning solution,

(P) oxidizing exposed silicon islands at 800° C. under a pressure of 150 atmospheres of dry oxygen to obtain a silicon oxide film of about 1000 angstroms in thickness,

(Q) depositing a layer of polycrystalline silicon of about 5000 angstroms in thickness on the substrate by chemical vapor deposition,

(R) applying a layer of photoresist over the film of polycrystalline silicon and defining a pattern in the layer of photoresist,

(S) removing the polycrystalline silicon by plasma etching from areas not protected by photoresist,

(T) removing the remaining photoresist in an oxygen plasma,

(U) applying a layer of photoresist over the substrate and then removing the photoresist from selected regions of the substrate,

(V) implanting boron into the exposed regions of the substrate at a voltage of 70 kilovolts and at a dose rate of about 1×10^{15} atoms/cm^2 into the exposed regions of the wafer,

(W) removing the photoresist in an oxygen plasma,

(X) cleaning the substrate with the acid cleaning solution,

(Y) applying a layer of photoresist to the substrate and then removing the photoresist from selected regions of the wafer,

(Z) implanting phosphorous into the exposed regions at 200 kilovolts and at a dose rate of about 4×10^{15} atoms/cm^2,

(AA) removing the layer of photoresist in an oxygen plasma,

(BB) annealing the substrate in dry nitrogen for about 60 minutes at a temperature no greater than 900° C.,

(CC) applying a layer of silicon oxide of about 2000 angstroms in thickness over the substrate by chemical vapor desposition,

(DD) applying a layer of photoresist over the substrate and defining a pattern in the photoresist,

(EE) opening windows in the chemically vapor deposited silicon oxide layer with a hydrofluoric acid etch,

(FF) removing the layer of photoresist in an oxygen plasma,

(GG) cleaning the substrate,

(HH) applying a metallic layer of about 10,000 angstroms in thickness over the substrate,

(II) applying a layer of photoresist over the metal layer and defining a pattern in the photoresist,

(JJ) etching the metal with an acid solution,

(KK) stripping the photoresist in an oxygen plasma, and

(LL) heat treating the metal layer at 500° C. for about 10 minutes in an atmosphere of nitrogen.

4,179,793

METHOD OF MAKING A CHARGE TRANSFER DEVICE

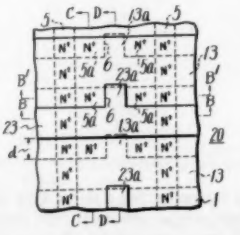
Yoshiaki Hagiwara, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 12, 1977, Ser. No. 841,551

Claims priority, application Japan, Oct. 14, 1976, 51-123189

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—578 **10 Claims**



1. A method of making a charge transfer device in which charge transfer portions, each having gate electrodes, are arranged, and an effective asymmetrical potential is produced in a carrier transfer direction in each of said charge transfer portions by an affect of potential of a channel stopper region upon carrier transfer, said method comprising the steps of:

(a) forming channel stopper regions in a surface of a semiconductor substrate to define a charge transfer line therebetween;

(b) forming and shaping a first conductive layer electrically insulated from said substrate over said surface to provide a first set of gate electrodes;

(c) forming and shaping a second conductive layer electrically insulated from said first conductive layer to provide a second set of gate electrodes interleaves with said set but spaced therefrom adjacent said channel stopper regions; and

(d) forming a portion, which narrows a width of said charge transfer line and produces said asymmetrical potential, by selectively doping an impurity through said spaces between said first and said second sets of electrodes and into said substrate adjacent said channel stopper regions while using said first and second sets of electrodes as diffusion masks.

4,179,794

PROCESS OF MANUFACTURING SEMICONDUCTOR DEVICES

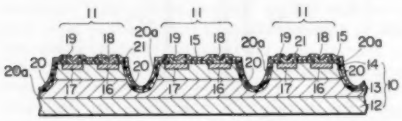
Masao Kosugi, and Takashi Ogata, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizvoka, Japan

Continuation of Ser. No. 705,461, Jul. 15, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,275

Claims priority, application Japan, Jul. 23, 1975, 50-89193

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—580 **10 Claims**



1. In a process of manufacturing a plurality of semiconductor devices, including the successive steps of:

(a) forming a number of semiconductor device units in mutually adjacent fashion, on top of a common semiconductor wafer;

(b) etching those portions of said semiconductor wafer located between the respective semiconductor device units to form recessed grooves between the peripheral regions of the respective semiconductor device units; and

(c) cutting apart said semiconductor wafer at the recessed groove portions into individual semiconductor devices,

the improvement of preventing damage and contamination of exposed portions of the semiconductor units comprising after step (b) and before step (c) conducting the successive steps of:

(d) forming a stain film having a thickness of the order of 0.05 micrometers by chemical oxidation of silicon on the entire surfaces of said recessed grooves immediately after the etching step (b), whereby the surfaces of the recessed grooves are protected from contamination, and the adhesion between the surfaces of the recessed grooves and a subsequently applied thermosetting resinous film is improved; and thereafter

(e) covering and adhering to said stain film on the recessed grooves a thermosetting resinous film, prior to the cutting of step (c).

4,179,795

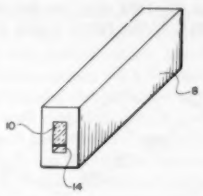
METHOD FOR FORMING A DRIVE HOLE IN ARC PLASMA SPRAY FABRICATED FERRITE PHASORS

Richard W. Babbitt, Fair Haven, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 15, 1978, Ser. No. 915,638

Int. Cl.[2] H01F *41/02*

U.S. Cl. 29—602 R **14 Claims**



1. The method of making a drive wire hole in a ferrite toroid during the fabrication of said toroid wherein a ferrite powder is arc plasma spray deposited on a dielectric insert having a longitudinal surface, said method comprising the steps of:

bonding a slab of boron nitride on the longitudinal surface of the dielectric insert;

arc plasma spray depositing said ferrite powder on the composite structure of said slab of boron nitride bonded to the longitudinal surface of said dielectric insert within a temperature range wherein said boron nitride slab maintains its bond and original shape;

and annealing said composite structure of boron nitride bonded to the dielectric insert and bearing a coating of ferrite powder at temperatures wherein only said boron nitride slab is completely sublimated to form the drive wire hole.

4,179,796

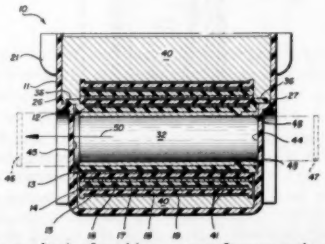
METHOD OF MAKING A TRANSFORMER WITH AN IMPROVED INSULATION SYSTEM

Richard Allen, Richardson, Tex., assignor to Varo Semiconductor, Inc., Garland, Tex.

Filed Mar. 13, 1978, Ser. No. 886,125

Int. Cl.[2] H01F *41/12*

U.S. Cl. 29—605 **5 Claims**



1. The method of making a transformer unit which comprises the steps of: forming an electrically conductive transformer winding on a tubular bobbin; inserting a heat-expandable core pin into the tubular bobbin; locating the wound bobbin and core pin assembly in the interior of a casing; heating the casing and winding and thereby expanding the core pin to contact the casing; subjecting the heated casing interior and winding to a vacuum; introducing a liquid potting composition into the casing; causing the potting composition to flow between the core pin and bobbin so as to form an electrically

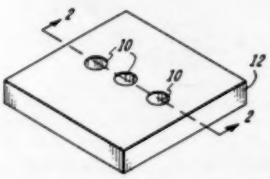
insulative coating inside the bobbin hollow; permitting the potting composition to solidify; and removing the core pin from the bobbin leaving a layer of potting compound inside the bobbin hollow and in substantial confluence with the potting compound inside the casing.

4,179,797

METHOD OF MAKING A RESISTOR ARRAY

Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 23, 1978, Ser. No. 889,796
Int. Cl.[2] H01L *21/84;* **H01C** *1/034, 17/02*
U.S. Cl. 29—610 R **3 Claims**



1. A process of making a resistor array comprising the steps of:

providing a plurality of voids in a substrate of electrically non-conductive material,

filling the voids completely with a flowable resistance material, said resistance material having a resistivity less than the resistivity of said material of said substrate, and

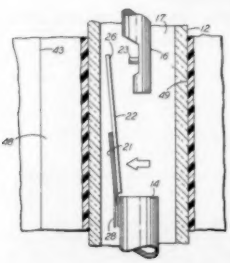
hardening said resistance material to thereby provide resistors within said substrate.

4,179,798

METHODS OF ADJUSTING SEALED CONTACT SWITCHES

Itamar B. Einbinder, Overland Park, Kans., and Albert A. Hamilton, Belton, Mo., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,681
Int. Cl.[2] H01H *11/00, 65/00, 51/28*
U.S. Cl. 29—622 **7 Claims**



1. A method of adjusting a normally unoperated position of an armature with respect to a contact, the armature and the contact being located with an envelope of a sealed contact switch, the armature being resiliently hinged at one end by a reed spring to elastically deflect about the hinged end of the armature in a path between the unoperated position in which another end opposite the hinged end of the armature is located adjacent to and spaced from the contact and an operated position in which said another, opposite end of the armature becomes located against the contact, the method comprising:

determining the width of a gap between said another end opposite the hinged end of the armature and the contact when the armature is located in the normally unoperated position;

orienting the envelope with respect to a magnetic pole face such that the armature becomes positioned substantially perpendicular to the direction of the magnetic field, the path becomes substantially aligned with the direction of the magnetic field and the contact becomes located between the magnetic pole face and the armature when the gap width has been found to be greater than a desired value of the gap width, and the armature becomes located between the contact and the pole face when the gap width has been found to be less than the desired value of the gap width; and

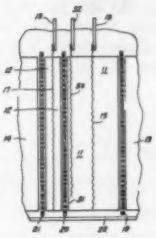
magnetically pulling the armature toward the pole face to deflect the reed spring beyond its elastic limit of deflection to thereby permanently reposition the armature within the envelope when located in the normally unoperated position spaced from the contact, such that the value of the gap width deviates less from the desired value of the gap width than the width prior to magnetically pulling the armature.

4,179,799

METHOD OF MOLDING A DOUBLE CATHODE HAVING A SENSING GRID FOR A POROUS ELECTRODE PRIMARY BATTERY

David H. Fritts, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 844,162, Oct. 21, 1977, Pat. No. 4,126,735.
This application Apr. 17, 1978, Ser. No. 896,863
Int. Cl.[2] H01M *4/08*
U.S. Cl. 29—623.5 **1 Claim**



1. The method of molding a double cathode having a sensing grid for a porous electrode primary battery comprising:

a. placing a relatively thin first carbon slurry in a mold;

b. placing a charge sensing grid on the said first carbon slurry;

c. placing a second carbon slurry in the mold over the said sensing grid;

d. placing a current collecting grid on the said second slurry;

e. placing a third slurry over the said current collecting grid forming the said double cathode; and

f. curing the said double cathode.

4,179,800

PRINTED WIRING BOARD COMPRISING A CONDUCTIVE PATTERN RETREATING AT LEAST PARTLY IN A THROUGH-HOLE

Toshio Takaba, and Toshimasa Kobayashi, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Division of Ser. No. 734,169, Oct. 20, 1976, abandoned. This application May 15, 1978, Ser. No. 906,166
Claims priority, application Japan, Oct. 20, 1975, 50/126170; Nov. 17, 1975, 50/138475
Int. Cl.[2] H05K *3/06*
U.S. Cl. 29—625 **1 Claim**

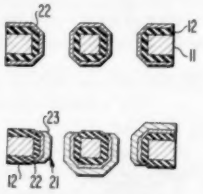
1. In a method of manufacturing a printed wiring board including the step of providing a substrate having a pair of

principal surfaces and a through-hole having, in turn, an inwardly directed surface and an outwardly flaring surface connecting said inwardly directed surface to one of said principal surfaces and being contiguous to said one principal surface along a boundary portion, the improvement comprising the steps of:

forming a metallized layer on said one principal surface, boundary portion and outwardly flaring and inwardly directed surfaces so that a first portion of said metallized layer is formed on said one principal surface and a second portion of said metallized layer is formed on said boundary portion;

applying a photoresist film on said first metallized layer portion to cover said through-hole and protrude in contact with said second metallized layer portion partly into said through-hole;

exposing said photoresist film to light by the use of a mask defining a first area narrower than a second area surrounded by said second metallized layer portion with said first area placed in substantial registry with said second area;



removing that first portion of said photoresist film which corresponds to said first area to uncover that third portion of said metallized layer which is surrounded as defined by said first area by said second metallized layer portion and is formed on said inwardly directed surface;

depositing an electrically conductive layer on said third metallized layer portion so as not to reach said first metallized layer portion wholly circumferentially of said second metallized layer portion;

removing that second portion of said photoresist film which does not correspond to said first area and has remained after said first photoresist film portion removing step throughout said conductive layer forming step; and

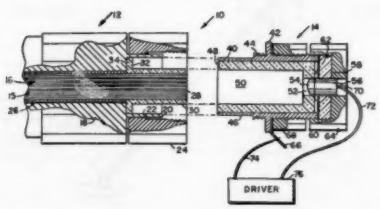
removing that portion of said metallized layer on which said conductive layer is not formed.

4,179,801

METHOD OF MAKING A MINIATURE FIBER OPTIC CONNECTOR

Ernest E. Hollis, Bedford, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 2, 1977, Ser. No. 773,453
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—626 **8 Claims**



1. A method of modifying the female portion of a standard metal-bodied coaxial connector to accommodate an active electro-optical element adapted to be aligned with and coupled to a fiber optic element carried by the male portion of the connector, comprising the steps of:

removing the central electrical contact;

enlarging the hole left after removal;

providing a printed circuit board with a metalized layer on one surface thereof;

boring a hole through the printed circuit board of a size to accomodate the active electro-optical element;

punching out a portion of the printed circuit board surrounding the hole bored therethrough;

mounting an active element having laterally extending electrical contact tabs through the hole in the punched-out portion of the printed circuit board such that the tabs make electrical contact with the metalized layer; and,

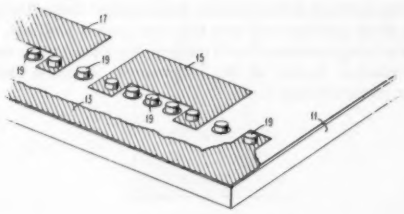
mounting the printed circuit board at the end of the female connector such that said element is adjacent the enlarged hole and such that electrical contact is made between the metalized layer on the printed circuit board and the housing of the female portion of the coaxial connector, whereby the modification does not require the mounting of the device inside the female portion **20** of the connector.

4,179,802

STUDDED CHIP ATTACHMENT PROCESS

Kailash C. Joshi, Endwell, and Ronald N. Spaight, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,445
Int. Cl.[2] H05K *3/34*
U.S. Cl. 29—628 **8 Claims**



1. A method of bonding a first integrated circuit device having a number of connecting points to a second integrated circuit device having a like number of connecting pads, both first and second devices having approximately equal thermal expansion characteristics, said method comprising the steps of:

fabricating a metal stud at each of said connecting points of said first integrated circuit device, the top of each stud providing a bondable surface;

applying a amount of solder not exceeding 4×10^{-3} centimeters thick to each of said connecting pads of said second integrated circuit devices;

aligning said first and second integrated circuit devices so that each metal stud of said first device is positioned proximate its respective connecting pad of said second device; and

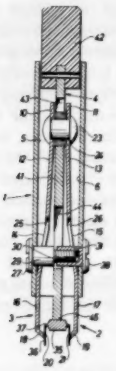
applying sufficient pressure and temperature to the studs and pads to bond each of said studs to its respective connecting pad.

4,179,803

DEVICE FOR HANDLING ELECTRICAL COMPONENTS

Per O. M. Wolkert, Kungsvagen 1, Trangsund, Stockholm, Sweden

Filed Oct. 25, 1977, Ser. No. 845,133
Claims priority, application Sweden, Oct. 21, 1976, 7611721
Int. Cl.[2] H05K *3/30, 13/04*
U.S. Cl. 29—741 **21 Claims**



1. A device for handling an electrical component having terminal pins extending in the same direction by engagement with such pins, comprising in combination: a body part; cooperating elongate gripping elements supported by said body part for longitudinal movement relative thereto between a first position corresponding to an 'engage' condition of the component, and a second position corresponding to a 'release' condition thereof, said gripping elements having respective component-engaging ends thereto which are less widely spaced in the 'engage' condition of the component than in its 'release' condition; cooperating means for varying the spacing of the component-engaging ends of the gripping elements on movement of said elements between said first and second positions; and an actuator operatively connected with the gripping elements for effecting controlled longitudinal displacement thereof relative to the body part between said first and second positions, said actuator being connected with the gripping elements for movement relative thereto in the longitudinal direction thereof within predetermined limits.

4,179,804

ADJUSTABLE ROLLER CABLE FEEDING AND STRIPPING TOOL

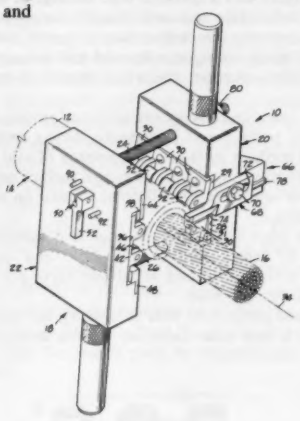
Walter J. Maytham, Los Altos, Calif., assignor to Speed Systems, Inc., Los Altos, Calif.

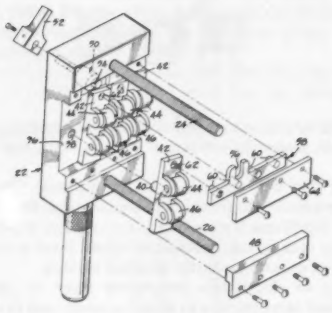
Filed May 23, 1978, Ser. No. 908,754
Int. Cl.[2] B21F *13/00*
U.S. Cl. 30—90.7 **7 Claims**

1. A cable insulation stripping tool comprising:

a body; and

roller means mounted to the body and adapted for contacting and supporting a cable which can be seated thereon, and means for changing the position of said roller means relative to said body to provide a plurality of angles as defined by the rotational axis of the roller means relative to the longitudinal axis of the cable seated on the roller means; and





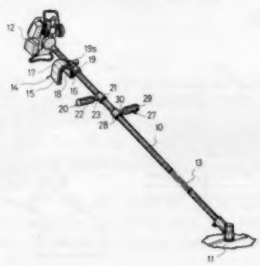
blade means mounted to the body and having a cutting edge, the blade means positioned relative to the body so as to engage insulation of the cable.

4,179,805

PORTABLE POWER OPERATED TOOL

Sakuji Yamada, Kobe, Japan, assignor to Yamada Machinery Industrial Co., Ltd., Kobe, Japan

Filed May 5, 1978, Ser. No. 903,084
Claims priority, application Japan, Jun. 7, 1977, 52-67643
Int. Cl.[2] A01D *55/18;* **B26B** *25/00*
U.S. Cl. 30—122 **18 Claims**



1. A portable power operated tool which comprises

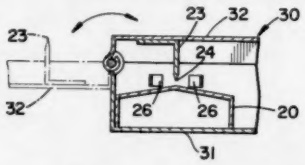
an elongated tubular housing,
an engine mounted to one end of said tubular housing,
a cutting implement mounted to the other end of said tubular housing,
a drive shaft which passes through said tubular housing for transmitting power from said engine to said cutting implement,
a fixing element for receiving and fixing a front part of an operator's arm,
said fixing element being located in position near said engine and along with one side of said elongated tubular housing,
a first handle located in front of and spaced from said fixing element,
a handle grip connected to said first handle and disposed on the same side with said fixing element, and
a second handle located in front of and spaced from said first handle.

4,179,806

PILL-SPLITTING IMPLEMENT WITH NON-CRUMBLING CHARACTERISTIC

Nathan S. Lieptz, 23506 Beachwood Blvd., Beachwood, Ohio 44122

Filed Jan. 3, 1978, Ser. No. 866,555
Int. Cl.[2] B26B *11/00*
U.S. Cl. 30—124 **5 Claims**



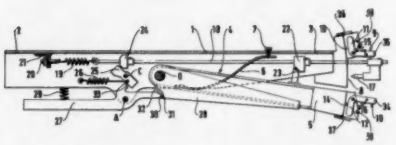
1. In a pill-dividing device, the combination of a first means providing a support surface for holding a pill in position to be split, second knife-edge means pivotally connected to said first means for arcuate movement into pill-dividing engagement, pill-positioning members associated with said first means for adjustably centering the pill on said support surface into a position of predetermined alignment with said pill-dividing movement of said second knife-edge means, and said pill-positioning members including a pair of spaced movable arms resiliently biased for pill-engaging movement toward each other in the diametrical plane of the supported pill, said arms being yieldably displaceable away from each other in response to knife-edge induced displacement of the divided pill portions.

4,179,807

HAND TOOL FOR CUTTING AN OPTICAL FIBRE

Bernard Allias, Brétigny sur Orge, and Charles Decaudin, Vigneux, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 29, 1978, Ser. No. 920,895
Claims priority, application France, Jul. 13, 1977, 77 21695
Int. Cl.[2] B26B *17/02*
U.S. Cl. 30—124 **11 Claims**



1. A hand tool for precise severing of an optical fibre, said tool comprising:

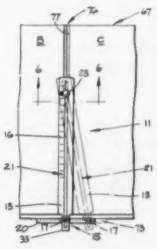
two articulated legs having first, free ends at the same distance from their pivot point said first ends being close together in a rest position and being movable apart when the tool is operated;
a forming part for bending the optical fibre, said part having a convex profile and being installed at the first end of one of the legs so that its convex surface is perpendicular to the plane of the two legs and faces away from the pivot point of these legs;
one clip on each arm and installed on either side of the forming part, in the extension of the convex profile thereof, each arm being on the first end of the corresponding leg and said clips mounted for gripping the optical fibre on either side of the forming part;
a moveable knife disposed on the first end of one of the legs, facing the convex profile of the forming part and extending thereacross;
first resilient means for moving the first ends of the two legs apart;
second resilient means for tending to bring the knife towards the forming part;
a setting mechanism for moving the knife away from the forming part when the first ends of the two legs are moved towards each other;
a locking mechanism for keeping the first ends of the two legs close together when they are in the rest position and for keeping the knife away from the forming part; and
a double-action release mechanism which, when the tool is operated, firstly releases the first resilient means progressively and then also releases the second resilient means progressively.

4,179,808

CUTTING GUIDE TOOL FOR FABRICATION OF AIR DUCT TRANSITIONS AND METHOD OF ITS USE

Harvell M. Smith, Conifer, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 10, 1978, Ser. No. 904,662
Int. Cl.[2] G01B *3/14*
U.S. Cl. 30—293 **4 Claims**



1. A cutting guide for use with a flat rectangular sheet of fibrous board, said sheet having grooves extending across a major surface thereof and perpendicular to an edge thereof and for use with a cutting tool for cutting a wedge-shaped piece of material from said fibrous board comprising:

(a) a guide strip having a flat first major surface and a longitudinally extending straight-edged slot, said slot passing through said guide strip, and a second major surface having incremental markings thereon adjacent said slot;
(b) a cross-arm having a first surface adapted to contact said edge and a second surface having similar incremental markings extending in opposite directions from a central location, means for mounting said cross-arm in said slot at a first end portion of said guide strip such that said cross-arm first surface is generally perpendicular to said guide strip first major surface and said cross-arm second surface is generally facing in the same direction faced by said guide strip second major surface, and said cross-arm freely

pivots about its midpoint on an axis perpendicular to said guide strip first major surface, and said mounting means slidably engages said slot for movement only along a limited extent of said slot, the incremental markings on said guide strip beginning on a reference line coinciding with the plane of said cross-arm first surface when said surface is in the position farthest from said first end of said guide strip and perpendicular to the lengthwise direction of said slot; and

(c) anchoring means mounted in said slot for movement over the incrementally marked extent of said slot and for being fixed at any point there along, and said anchoring means also having means for engaging said groove so as to be centrally located therein when said guide strip first major surface lies flatly adjacent said major surface of said fibrous sheet, and for providing a pivot point for rotation of said guide strip about an axis through said anchoring means perpendicular to said major surface of said fibrous sheet.

4,179,809

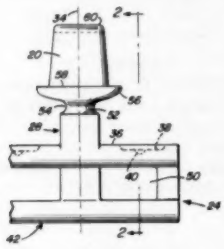
DENTAL IMPLANT

Maurice J. Fagan, Jr., and Maurice J. Fagan, III, both of 5360 Peachtree-Dunwoody Rd., NE., Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 581,419, May 27, 1975, Pat. No. 4,050,157. This application Jun. 7, 1977, Ser. No. 804,383

Int. Cl.[2] A61C *8/00*

U.S. Cl. 433—176 **6 Claims**



1. A dental implant for anchoring an attachment to a jawbone, comprising an endosseous blade type of base having two spaced edge portions, a shank projecting from one of the edge portions on which the attachment is supported, said edge portions being elongated relative to the shank in a mesial-distal direction and endosseous stabilizer means adapted to be embedded with the base entirely within said jawbone, including a rounded cross-sectional enlargement of the base continuously along the other of the spaced edge portions.

4,179,810

DEVICE FOR MILLING SLOTS IN A JAWBONE FOR MOUNTING AN ENDOSSAL DEVICE

Axel Kirsch, Scharnhauser Str. 3, 7024 Bernhausen, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 845,819

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714321

Int. Cl.[2] A61C *13/00;* **A61B** *17/32;* **A61F** *5/04;* **B26B** *7/00*

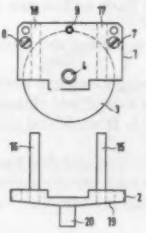
U.S. Cl. 433—75 **15 Claims**

1. A surgical tool for cutting a slot in a jawbone for implantation of an endossal implant to which a denture may be firmly fastened comprising, in combination:

(a) a housing-slide member comprising two parts, the second part of which has a bearing surface for bearing against a jawbone;

(b) a sawblade for cutting a precisely dimensioned slot in the jawbone rotatably mounted on the first part of the housing-slide member;

(c) guide means connecting the first and second parts of the housing-slide member which permits the parts to slide with respect to each other and further permits the sliding of the sawblade radially outwardly of the second part of the housing-slide member; and



(d) means for maintaining the bearing surface of the second part of the housing-slide member at a site on the jawbone.

4,179,811

FRONTAL MOUTH PLATE FOR ORTHODONTIC PROPHYLAXIS AND EARLY TREATMENT OF DENTAL ANOMALIES

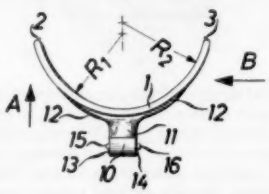
Rolf Hinz, Körnerstrasse 6, 4690 Herne, Fed. Rep. of Germany

Filed Jan. 27, 1975, Ser. No. 544,371

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1974, 7402919[U]

Int. Cl.[2] A61C *7/00*

U.S. Cl. 433—6 **2 Claims**



1. A frontal mouth plate for the early orthodontic prophylaxis of dental anomalies in infants, said plate being generally elongated with a middle portion separating a pair of end portions in the direction of elongation, said plate being elliptically curved in the direction of elongation, the radius of curvature (R_1) of the middle portion of the plate about its axis of curvature being proportioned to the radius of curvature (R_2) of the end portions about their axis of curvature as 3:4, said middle and end portions being uniformly merged together, said curved plate having a smooth, uninterrupted, concave inner surface which is parallel to said axes of curvature and abuttable with the exterior of the dental structure when the device is placed inside the lips and cheeks, said curved plate having a convex outer surface with an elongated post affixed to the middle portion thereof and extending outwardly therefrom for mounting a movable holder.

4,179,812

DENTAL BRACKET BONDING AGENT AND METHOD OF USE

Velton C. White, 17 N. Broadway, Des Plaines, Ill. 60016

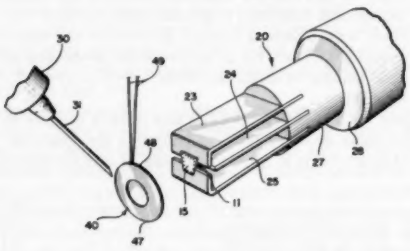
Filed Sep. 6, 1977, Ser. No. 830,425

Int. Cl.[2] A61C *7/00;* **B32B** *31/00*

U.S. Cl. 433—9 **9 Claims**

1. A method of at least temporarily bonding an orthodontic device to a tooth, comprising the steps of: interposing an open-scrim envelope containing a quantity of a finely divided, inert,

particulate filler material between the device and the tooth; infusing an alphacyanoacrylate resin throughout said filler material whereby the curing time of said resin is increased;



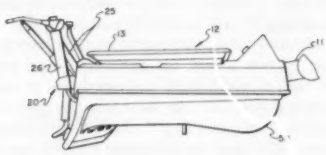
pressing the device toward the tooth to compress the matrix of filler material and resin between said device and said tooth; and retaining said device and matrix in place until said resin has cured.

4,179,813

DENTAL INSTRUMENT DELIVERY SYSTEM

Robert R. Runnells, Kaysville, and John C. Schmoegner, Kearns, both of Utah, assignors to MDT Instrument Company, Tualatin, Oreg.

Filed Mar. 20, 1978, Ser. No. 890,652
Int. Cl.[2] A61C *19/02*
U.S. Cl. 433—79 **25 Claims**



1. In a dental instrument delivery system including an instrument deck with an upper tray surface for loose articles, a hand piece storage structure at its front edge removably holding an array of hand pieces of various types, and approximately parallel lengths of flexible tubing with coiled memory suspended from the back and beneath said deck and connecting individual said hand pieces to utility sources such that each length may selectively be extended by moving the hand piece connected to it from the storage structure and the memory of said length will effect a retraction of said length when the hand piece is returned to the storage structure; the improvement comprising a bottom tray member secured beneath said deck to house and support said lengths of tubing, said bottom tray member having an opening proximate said recepticle structure such that each said length of tubing passes through said opening to connect to a said hand piece.

4,179,814

TOOTH CLEANING DEVICE

Louis P. Montanio, 2503 Prairie Creek Dr., Richardson, Tex. 75080

Filed Jan. 3, 1978, Ser. No. 866,759
Int. Cl.[2] A61C *1/08*
U.S. Cl. 433—99 **4 Claims**

1. A portable hand-held dental cleaning device, comprising:

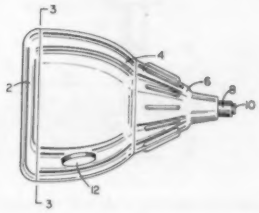
a housing adapted to fit the palm of the human hand and including a substantially flat back surface to fit adjacent a user's palm, with the flat surface blending into rounded top and side surfaces forming a generally oblate portion around which a user's fingers may fit for gripping;

a substantially frusto-conical protective shield removably mounted on the front of said housing such that said curved surfaces slope toward said shield, which includes an aperture whose axis is approximately central to said housing and substantially perpendicular to the portion of said back housing surface;

an electric motor means disposed within said housing and including a rotatable output shaft parallel to and spaced from the axis of the aperture of the protective shield;

a primary gear on the rotatable shaft of said electric motor;

a central geared shaft disposed in said housing and extending through the aperture of said protective shield such that the axis of said central geared shaft and the axis of said



aperture substantially coincide, wherein said central geared shaft directly

engages said primary gear;

a depressible switch for selectively activating the electric motor and being mounted on one of the rounded side surfaces adjacent the top rounded surface in a position so that the switch is accessible for use with either hand by either the thumb on one hand or the index finger on the other hand; and

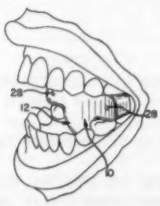
the end of said spaced shaft which extends outwardly of the housing including a connection for receiving a suitable tip for dental use.

4,179,815

DENTAL DEVICE

Carl S. Hoffman, Cheshire, Conn., assignor to TP Laboratories, Inc., LaPorte, Ind.

Filed Dec. 29, 1977, Ser. No. 865,526
Int. Cl.[2] A61C *5/14*
U.S. Cl. 433—140 **5 Claims**

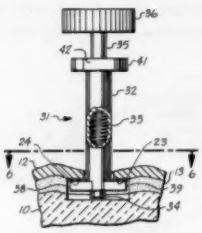


1. A dental device molded of thermal plastic material, natural or synthetic rubber, for holding open a patient's mouth and restricting tongue movement, which comprises a plurality of spaced generally box-shaped and rectangular in cross section bite blocks adapted to be engaged by occlusal surfaces of the upper and lower arches, and a shield extending between said bite blocks adapted to restrict movement of the tongue, said shield extending above and below the bite blocks and generally vertically when the device is placed within the mouth to prevent the tongue from engaging the lingual surfaces of the anterior teeth and further including an anterior face flush with the anterior ends of the bite blocks, and the posterior ends of the bite blocks extending posteriorly of the posterior face of the shield.

4,179,816
APPARATUS, METHODS AND INSTRUMENTS FOR REMOVING DENTAL RESTORATIONS

Grant W. Anderson, 932 Mullaghboy Rd., Glendora, Calif. 91740

Filed Sep. 21, 1977, Ser. No. 835,396
Int. Cl.[2] A61C 3/16
U.S. Cl. 433—161 18 Claims



1. A method of removing a dental restoration from a tooth, comprising in combination the steps of:

providing an instrument with lateral projection means at a lower portion thereof;

providing an aperture in and through the restoration;

extending said aperture into an oblong shape in a face of the restoration by providing said aperture with a sufficient first width in said restoration for a reception of said projection means therethrough, and a second width extending in the same plane as said first width at an angle to said first width and being too small to receive said projection means;

establishing part of the restoration at the aperture as a shelf facing in the direction of the tooth by undercutting beneath the restoration at said aperture in extension of said second width;

inserting said lower portion of the instrument into said oblong aperture, with said lateral projection means being oriented in alignment with said first width of said oblong aperture and being inserted to below said dental restoration;

rotating said lateral projecting means for moving said lateral projection means to below said shelf;

establishing at the aperture with said lateral projection means a force acting on the shelf relative to and away from the tooth; and

removing the restoration from the tooth with said force.

4,179,817
METHOD AND APPARATUS FOR PROVIDING REPEATABLE WIRELINE DEPTH MEASUREMENTS

Jean C. Lavigne, Chevreuse, and Gérard Ségéral, Orsay, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 16, 1976, Ser. No. 706,106
Claims priority, application France, Jul. 22, 1975, 75 22778
Int. Cl.[2] G01B 5/04
U.S. Cl. 33—129 28 Claims

1. Apparatus for providing a repeatable signal representative of movement of a wireline used in logging boreholes and suitable for driving a recorder under varying wireline measurement conditions for depth recording measurements from a borehole tool lowered in said borehole on said wireline, comprising:

means for producing independent signals, comprising:

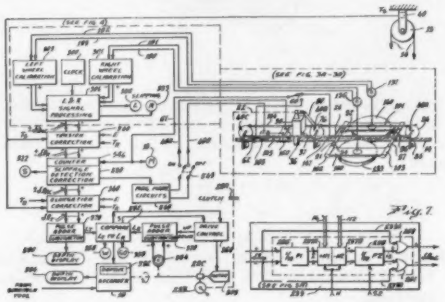
substantially identical wireline measurement wheels,

chassis for support and guidance of assemblies aligning said wheels in a generally horizontal plane along said wireline,

carriages for said wheels slidably mounted on opposite sides of said chassis, said slidable mounts providing for slidable movement of said carriages along two substantially parallel lines transverse to the direction of said wireline movement and rotation of said wheels in a plane generally parallel to a plane including said two parallel lines,

means for equally biasing said wheels to slide towards each other on said slidably mounted carriages and tangentially engage said wireline on opposite vertical sides of a single point with balanced contact pressures for mechanically coupling said wheels to said wireline in substantially the same manner to rotate said wheels with movement of said wireline,

means for pivotally supporting said slidable mounts and said carriages on said chassis and aligning the rotational plane of said wheels to include the path of said wireline at said



point, said slidably mounted carriages, biasing means and pivotal support means cooperating to yield to unbalanced lateral forces exerted on one of said wheels and maintain said coupling of said wheels to said wireline,

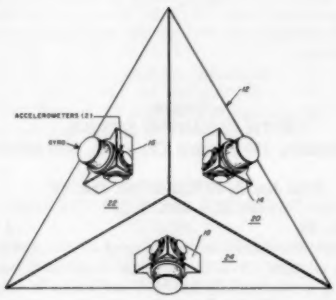
and low torque-load signal generators each responsive to the rotation of one wheel for generating said independent signals each of said signals corresponding to said wireline movement at generally the same point on said wireline and presumably corresponding to the same movement of said wireline under ideal measurement conditions; and

means for automatically utilizing said signals to provide a repeatable signal representative of said wireline movement when wireline measurement conditions are less than ideal.

4,179,818
TETRAHEDRAL REDUNDANT INERTIAL REFERENCE UNIT

Robert J. G. Craig, Malibu, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 7, 1976, Ser. No. 730,419
Int. Cl.[2] G01C 19/02
U.S. Cl. 33—321 10 Claims



1. A symmetrical redundant inertial reference unit comprising:

(a) a plurality of gyroscopes included in said reference unit,

the gyroscopes of said reference unit consisting solely of four two-degree-of-freedom gyroscopes, each said gyroscope having its two sensitive axes substantially perpendicular to each other;

(b) means associated with each gyroscope for generating two output signals from each said gyroscope, one output signal being generated for each of said two sensitive axes, each signal representing rate of angular motion about one sensitive axes; and

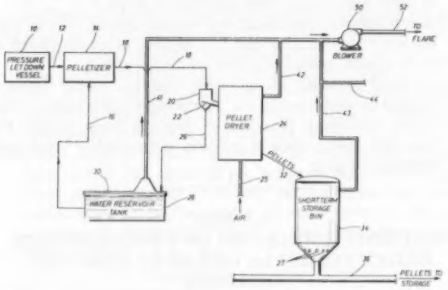
(c) means for fixedly positioning each said gyroscope with respect to each other in a primary coordinate system with the two sensitive axes of each of said four gyroscopes defining a plane which intersects the planes defined by the two sensitive axes of each of the other three gyroscopes at substantially the same angle, whereby said unit is capable of providing correct coordinate information about three mutually orthogonal axes despite failure of up to two of said four gyroscopes.

4,179,819

METHOD FOR CONTROLLING EMISSIONS OF ETHYLENE TO THE ATMOSPHERE

Bodie C. Pryor, Port Arthur, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 1, 1978, Ser. No. 901,384
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—12 **1 Claim**



1. In a process in which:

(a) an ethylene polymer is prepared by a mass polymerization process carried out at an elevated temperature under superatmospheric pressure,

(b) the molten ethylene polymer and unpolymerized ethylene are discharged from the polymerization reactor and passed through at least one pressure let down zone to remove the bulk of the unpolymerized ethylene from the molten ethylene polymer,

(c) the molten ethylene polymer from step (b) is extruded, contacted with water to solidify the polymer, and chopped into pellets,

(d) the water and ethylene polymer pellets from step (c) are separated with the polymer pellets being fed to a pellet dryer and the water being fed to a water reservoir tank,

(e) the dried pellets from the dryer of (d) are transferred to storage bins, and

(f) water from the reservoir tank of (d) is recycled to cool additional ethylene polymer;

the improvement which consists essentially of:

(g) covering the water reservoir tank with a vent hood having an air outlet affixed thereto,

(h) providing an air inlet and an air outlet in the pellet dryer,

(j) providing an air inlet and an air outlet in the product storage bin,

(k) connecting the air outlets of the vent hood, the pellet dryer, and the product storage bin to the inlet of an air blower,

(l) operating the air blower to draw ethylene gas and air from the vent hood, the pellet dryer and the product storage bin, and

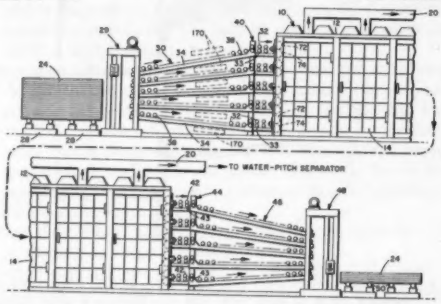
(m) feeding the air-ethylene output of the air blower to a flare stack gas burner.

4,179,820

APPARATUS FOR DRYING VENEER

Leslie M. Steffensen, Springfield; H. Gary Dutell, Eugene, and Robert A. Rydell, Corvallis, all of Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Division of Ser. No. 787,535, Apr. 14, 1977, Pat. No. 4,146,973.
This application Dec. 14, 1978, Ser. No. 969,499
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **23 Claims**



1. Apparatus for drying sheets of veneer comprising:

a drying chamber;

means for establishing a vacuum condition in said drying chamber;

at least one inlet opening into said chamber and at least one outlet opening from said chamber;

means for sealing said inlet and outlet openings to maintain the vacuum condition in said chamber;

means for continuously introducing a succession of veneer sheets individually through said inlet opening into said chamber while maintaining the vacuum condition therein;

conveyor means in said chamber for continuously moving veneer sheets from said inlet opening along a path through said chamber to said outlet opening;

at least two radiant infrared emitters in said chambers in spaced relation to said path for exposing each individual veneer sheet to radiant energy of the long wave infrared spectrum; at least one radiant infrared emitter being located on each of the opposite sides of said path so that substantially the entire face of both sides of each individual veneer sheet is exposed as the sheet moves along said path;

means for controlling the level of said radiation to which the sheets moving through said chmber are exposed to raise the surface temperature of said sheets to a level sufficient to dry said sheets but insufficient to result in damage thereto, and

means for continuously withdrawing veneer sheets from said chamber through said outlet opening while maintaining the vacuum condition therein.

4,179,821

DISHWASHER VENT ARRANGEMENT

LeRoy J. Herbst, and Thomas E. Jenkins, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

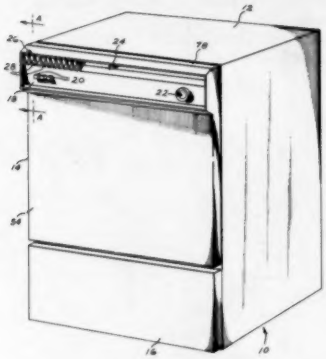
Filed Nov. 21, 1977, Ser. No. 853,699
Int. Cl.[2] F26B *25/06;* **B08B** *3/10;* **A47B** *81/00, 97/00*
U.S. Cl. 34—235 **14 Claims**

1. In a dishwasher of the type having an interior space for enclosing dish holding racks and further having heating means utilized in a drying cycle, heating the air within the interior

space, the improvement comprising a venting arrangement venting the relatively hot humid air from the interior chamber of said dishwasher during said dish drying cycle, said vent arrangement including:

vent duct means receiving heated air displaced from the interior chamber of said dishwasher;

a vent exit opening, directing heated air received from said vent duct means to the exterior of said dishwasher; and



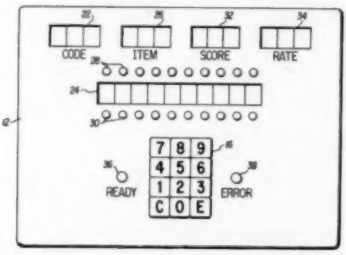
a plurality of vent exit ribs disposed across said vent exit opening, each of said vent exit ribs having a body portion extending across said vent exit opening, and at least one laterally projecting flange portion formed along the length of said body portion, whereby flow of said heated air about said vent ribs in passing through said vent exit opening is disrupted to minimize the formation of condensate thereon.

4,179,822

TESTING APPARATUS AND METHOD

Stephen C. Clark, III, 3900 16th St., NW., Washington, D.C. 20011

Filed Dec. 24, 1974, Ser. No. 536,257
Int. Cl.[2] G09B 7/06
U.S. Cl. 35—9 B **13 Claims**



1. A method of administering a plural answer test comprising the steps of:

(a) providing a question;

(b) providing a first plurality of possible answers including a plurality of correct answers and a plurality of incorrect answers, the answers being automatically weighted consecutively in the order selected by the student;

(c) selecting a first plurality of answers equal in number to the plurality of correct answers;

(d) identifying the correct ones of the first plurality of answers selected by the student;

(e) selecting answers equal in number to the number of incorrect ones of the first plurality of answers selected by the student;

(f) identifying the correct ones of the most recently selected answers;

(g) summing the weights of the correct answers as automatically weighted by the order in which selected; and,

(h) subtracting from the sum the weights of the correct answers if selected in the correct sequence to thereby determine the departure of the student's response from a perfect score.

7. A console for administering multiple answers, electronically scored tests comprising:

(a) a housing;

(b) a plurality of manually operable keys carried by said housing for selective operation by the testee;

(c) a first plurality of manually readable, visual displays carried by said housing for identifying the operated ones of said plurality of keys, the number of said displays being equal to the number of correct answers to a given question and said displays being within the view of a testee while in position to manually operate said plurality of keys;

(d) first display means carried by said housing for indicating the correctness of the key identification displayed at each of said first plurality of displays;

(e) a second plurality of manually readable, visual displays carried by said housing for identifying the ones of said plurality of keys operated subsequent to the indication of the correctness of the key identification displayed at each of said first plurality of displays, said second plurality of displays being within the view of a testee while in position to manually operate said plurality of keys;

(f) second display means carried by said housing for indicating the correctness of the key identification displayed at each of said second plurality of displays; and,

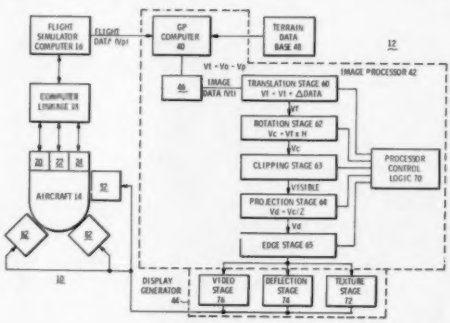
(g) a third plurality of manually readable, visual displays carried by said housing for indicating the test score to the testee, said third plurality of displays being within the view of a testee while in position to manually operate said plurality of keys.

4,179,823

REAL-TIME SIMULATION OF A POLYGON FACE OBJECT SYSTEM AS VIEWED BY A MOVING OBSERVER

John B. Sullivan, Santa Clara; David R. Marsh, Los Altos; Raymond C. Osofsky, San Jose; Steven R. Bryan, Campbell; William D. Fahey, Cupertino, and David E. Manners, Santa Clara, all of Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,210
Int. Cl.[2] G09B 9/08; H04N 7/18
U.S. Cl. 35—10.24 **12 Claims**



1. An image data system responsive to observer position data and observer orientation data provided by a motion simulation computer, for providing raster display data to a raster type display device defining a bounded two dimensional perspective view of a three dimensional object system formed by

polygon faces of that portion of an object coordinate system within the volume of vision of an observer in an observer coordinate system, comprising:

an object system data means for providing object position data defining the position within the object coordinate system of each of the vertices of the polygon faces, and for providing other object data which defines physical properties of the objects within the object system represented by the polygon faces;

an image data computer means for receiving the object data and adapted to receive at least the observer position data from the motion simulation computer, and for combining the data to form digital image data having a predetermined format with predetermined code bits for identifying the object position data and the other object data;

decoding means for receiving the formatted image data and decoding the code bits and storing object position data in a predetermined order;

translation means responsive to the observer position data for redefining the object position data relative to the observer coordinate system origin instead of the object coordinate system origin;

rotation means responsive to the observer orientation data for redefining the object position relative to a particular axis of vision within the observer coordinate system;

projection means responsive to the redefined object position data for converting the three dimensional position coordinates of each vertex of the polygon faces into two dimensional display coordinates to provide the bounded two dimensional view of the three dimensional object system;

slope determining means responsive to the two dimensional display coordinates for determining the slope of the polygon edges extending between adjacent vertices;

vertex sorting means responsive to the two dimensional display coordinates for determining the order in which the vertices appear within each display raster;

display generator means responsive to the display coordinates and to the slope of the polygon edges and to the other object data for providing the deflection and video signals required by the display device to provide the two dimensional perspective view of the three dimensional object system.

4,179,824

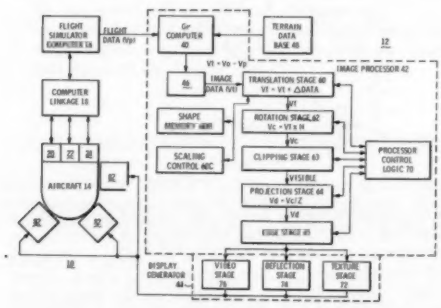
SIMULATION OF AN OBJECT SYSTEM FORMED BY POLYGON FACES HAVING A SERIES OF FUNDAMENTAL SHAPES AND DIMENSION

David R. Marsh, Los Altos, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed May 4, 1978, Ser. No. 902,622

Int. Cl.[2] G09B *9/08;* **H04N** *7/18*

U.S. Cl. 35—10.24 **16 Claims**



1. An image data system for providing a two dimensional perspective display of object items within a three dimensional object coordinate system formed by polygon faces, each face of which incorporates a fundamental object shape from a series of predetermined fundamental object shapes having various dimensions and orientations from a series of predetermined dimensions and orientations, and each face of which has an initial point, comprising:

data source means for providing image data in accordance with a predetermined data format including the following types of image data

initial position data for defining the position of the initial point for each polygon face with respect to the object coordinate system,

shape data for defining the relative positions of the vertices of each object shape of the series of predetermined fundamental object shapes, with respect to the initial point for faces incorporating that object shape, each fundamental object shape being formed by straight edges of predetermined dimensions and orientations extending between the vertices of that object shape,

shape data associated with each initial point for modifying the dimensions of the incorporated fundamental shape to provide the vertices of the face for that initial point, and

other data associated with the initial points for defining other visual parameters for the face thereof, the image data having codes bits associated therewith for distinguishing between the initial positional data and the shape data and the other data;

image data decoder means responsive to the code bits for processing each type of image data;

random access memory means for receiving shape data at predetermined address locations in response to the image data decoder means;

scalor means responsive to the shape data in the random access memory and to the scale data for changing the dimensions of the edges of the fundamental object shape incorporated by each face;

accumulator means which receives the initial position data for each initial point in response to the image data decoder means and receives the scaled shape data for that initial point from the scalor means in response to the image data decoder means for combining each initial point with the scaled shape data therefor to provide the position data of the remaining vertices of each object face;

image data processor means for providing two dimensional display coordinates for each face vertex which maintains the three dimensional perspective of the object faces; and

display means for receiving the display coordinates and generating a two dimensional visual display of the object face system in perspective.

4,179,825

APPARATUS FOR TEACHING NUMERICAL CONCEPTS

Noriaki Iwao, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 14, 1977, Ser. No. 842,111

Claims priority, application Japan, Oct. 15, 1976, 51-139171[U]

Int. Cl.[2] G09B *19/02*

U.S. Cl. 35—32 **15 Claims**

1. A teaching apparatus for use in teaching numerical concepts which comprises:

a housing having an interior and first and second display locations visible from the exterior of said housing,

a first display member having a series of indicia thereon,

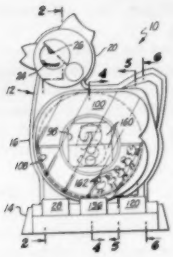
a first mounting means movably supporting said first display member so that it can be moved relative to said first display location from a first position to a series of successive positions in each of which only one of said indicia on said first display member is visible from the exterior of said housing,

a second display member having a series of indicia thereon,

a second mounting means movably supporting said second display member so that it can be moved relative to said second display location from a first position to a series of successive positions in each of which a number of said

indicia corresponding to the number of times said second display member has been moved is visible from the exterior of said housing,

advancing means for concurrently moving said display members from said first positions to said successive positions, said advancing means including a lever pivotally



mounted on said housing, an actuator button on said lever, said actuator button extending outwardly from the exterior of said housing and mechanical linkage means connecting said lever with said display members,

a return means for causing the concurrent return of said first and second display members from any of said successive positions to said first positions.

4,179,826

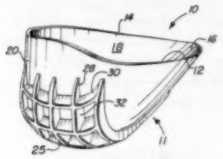
FOOT CUSHIONING DEVICE

Murray R. Davidson, 5702 N. 19th Ave., Phoenix, Ariz. 85015

Filed Dec. 9, 1977, Ser. No. 859,123

Int. Cl.[2] A43B *7/32, 21/32*

U.S. Cl. 36—69 **8 Claims**



1. A foot cushioning device designed in view of the physiological and kinetic considerations of the foot comprising:

(a) a resilient body member having a medial side, a lateral side, bottom and rear walls defining a recess conforming to generally at least the os calcis portion of the foot, said rear wall adapted to extend along the plantar posterior portion of the heel to at least a location corresponding approximately to the vertical terminus of the os calcis;

(b) resilient shock absorbing means extending from the outer surface of said body member from a first end on the posterior plantar portion of the rear wall to the second end at a location on the bottom wall of said body member, said shock absorbing means having the greatest depth in the heel strike area and tapering to said bottom and rear walls at said first and second ends, said shock absorbing means further extending from said body at said lateral and medial side walls whereby forces imposed by heel strikes are absorbed by deflection and deformation and antipronatory motion is induced to relieve stresses placed on the foot and leg by deflection of said shock absorbing means and whereby upon release of said shock from said shock absorber means returns substantially to its normal position.

4,179,827

FOOT CLAMPING DEVICE PARTICULARLY FOR SKI BOOTS

Franco Vaccari, Via Paleoveneti, 3/3, Montebelluna, Treviso, Italy

Filed Oct. 2, 1978, Ser. No. 947,988

Claims priority, application Italy, Oct. 13, 1977, 22489/77B[U]; Mar. 15, 1978, 21178/78B[U]

Int. Cl.[2] A43B *5/04, 21/36*

U.S. Cl. 36—119 **12 Claims**

1. A foot clamping device, particularly for ski boots, comprising, inside the boot body, a presser member acting in a position corresponding with the foot heel region, there extending from said presser member a threaded peg which is rotatably engaged in a threaded bush associated with a boss on the outside of said body and which, when rotated, causes said presser member to traverse, characterized in that it comprises, for rotating said boss, a strap rigid at one end with said boss and constituting a closure element for said boot.

4,179,828

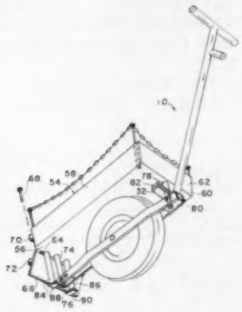
MULTI-PURPOSE LABOR SAVER HAND TOOL

Fred Brunty, Village Green-140, Princeton, W. Va. 24740

Filed Apr. 13, 1978, Ser. No. 895,732

Int. Cl.[2] E01H *5/02;* **A01D** *7/10*

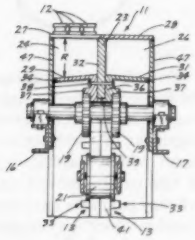
U.S. Cl. 37—53 **4 Claims**



1. In a vehicle having a handle for manual propulsion, a frame attached to the handle, and wheel support for the frame, the improvement comprising: the frame including a left and a right side piece in laterally spaced relation, the wheel support comprising a single wheel, an axle mounting the single wheel between the left and right side pieces, the handle projecting at an upward angle rearwardly from the frame, a transverse attachment for material working, means detachably fixing a middle portion of the transverse attachment to the frame forward of the wheel, a load carrier over the wheel, first means detachably connecting the load carrier with the frame forward

of the wheel, second means detachably connecting the load carrier with the frame rearward of the wheel, the load carrier having a body, a pair of forward legs projecting downwardly from the body respectively laterally of the first means, the downward projection of said pair of forward legs being below the frame for serving as supports in conjunction with the wheel, and the second means comprising a pin-in-hole attachment and having adjacent the lower end thereof a fixed cross member for pushing and for limiting sinking in soft ground when the load carrier is resting on the ground.

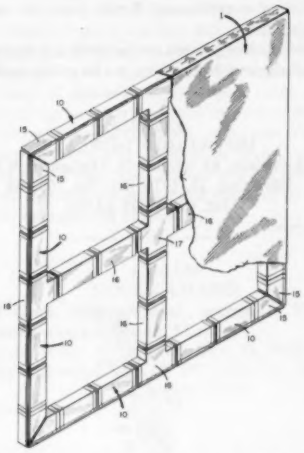
4,179,829
TRENCHING MACHINE
Franklin C. Kinkade, R.R. #4, Creston, Iowa 50801
Filed Dec. 12, 1977, Ser. No. 859,796
Int. Cl.[2] E02F *5/08*
U.S. Cl. 37—94 **3 Claims**



1. In an excavating machine including:
(a) a main frame,
(b) a digging unit mounted on the main frame for rotational movement including a rim structure with an outer peripherally extended spoil receiving section comprised of a pair of back to back channel members open to opposite sides of the digging unit with the leg sections thereof opposite each other transversely of said rim structure so that radially opposite portions of said leg sections are uniformly spaced radially of said rim structure over the circumferential length thereof,
(c) each outer peripheral leg section of a channel member formed with circumferentially spaced spoil receiving inlets,
(d) digging means for each inlet secured to each outer peripheral leg section at the trailing end of the associated inlet so as to extend into the inlet toward the leading end thereof,
(e) said digging means having the leading end thereof spaced a distance from the leading edge of the inlet associated therewith a distance less than the radial spacing between the leg sections of said channel members and
(f) scraper elements mounted on said frame structure to remove spoil from said channel members on rotational movement of the digging unit.

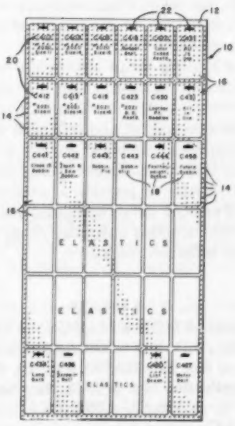
4,179,830
ADJUSTABLE FRAME FOR STRETCHING SHEET MATERIAL
Terrence R. Lamb, 3549 S St., NW., Washington, D.C. 20007
Continuation-in-part of Ser. No. 823,111, Aug. 9, 1977, Pat. No. 4,144,660. This application Jun. 6, 1978, Ser. No. 913,243
Int. Cl.[2] D06C *3/08*
U.S. Cl. 38—102.5 **11 Claims**

1. An adjustable framing device for stretching sheet material comprising: a plurality of hollow frame segment members having a front side over which a canvas is to be stretched; said frame segment members each having two side walls, connecting upper and lower walls which define a hollow interior and first and second ends; said framing device further comprising a pair of corner frame segment members for forming each corner of said frame, means for interconnecting one end of said frame segment members with one of said corner frame segment members to form a frame; each of said corner frame segments having two parallel upper and lower edges, a perpendicular edge adapted to mate with said one end of an adjacent frame segment member and being located at a remote position from



the corner of the frame, and a side edge nearest the corner, said side edge extending at a 45° angle with respect to said parallel upper and lower edges whereby said side edges which extend at said 45° angle mate with each other when said pair of corner segments are closed to form said frame and means for interconnecting and adjusting the separation of said pair of corner frame segments.

4,179,831
DISPLAY SET-UP PATTERN
Trix C. Cook, Hartsdale, N.Y., assignor to Textron Inc., Providence, R.I.
Filed Jul. 22, 1977, Ser. No. 818,269
Int. Cl.[2] G09F *3/18*
U.S. Cl. 40—19.5 **3 Claims**



1. A display set-up pattern for use in arranging a retail perforated board display comprising
a single large sheet of material,

a plurality of package outlines printed on the sheet to indicate the locations of packages in the completed display,

indicia means associated with each package outline to identify the type of package associated with each package outline,

hook guide means formed on the sheet and associated with each package outline to indicate the proper location for insertion of a perforated board hook to support each package, and

a grid of black dots printed on the sheet and sized and spaced so as to align with the holes in the perforated board.

4,179,832

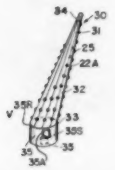
INFLATABLE DISPLAYS

Jerome H. Lemelson, 85 Rector, St. Metuchen, N.J. 08840

Filed Dec. 29, 1976, Ser. No. 755,144

Int. Cl.[2] **G09F** *13/00*

U.S. Cl. 40—540 **15 Claims**



1. A display comprising is combination:

an elongated inflatable enclosure,

an inflatable base secured to said inflatable enclosure for supporting said inflatable enclosure with the longitudinal axis thereof extending upright from a supporting surface,

said inflatable enclosure having a flexible side wall adapted to become erect and to extend upwardly from said base when said enclosure and said base are inflated and said base is disposed on said supporting surface,

electrical conducting means comprising at least one elongated flexible cable containing at least one wire pair for conducting electrical energy along the length of said cable,

means for flexibly supporting said electrical cable against said flexible side wall of said enclosure to permit the cable to extend longitudinally along most of the length of said inflatable enclosure,

a plurality of electric lamps electrically connected to said cable at different locations along the length of said cable and supported at different locations longitudinally along said flexible side wall of said inflatable enclosure, and

means for supplying electrical energy to the conducting elements of said cable for energizing said electric lamps connected thereto to provide a display formed of said plurality of electric lamps energized and emitting light at said different locations upwardly along said flexible side wall of said inflatable enclosure.

4,179,833

INFORMATION REMINDING DEVICE

Robert R. Knodel, P.O. Box 40339, Santa Barbara, Calif. 93103

Continuation of Ser. No. 769,897, Feb. 18, 1977, abandoned.

This application Sep. 5, 1978, Ser. No. 939,185

Int. Cl.[2] **G09F** *3/14*

U.S. Cl. 40—21 C **2 Claims**

1. An information reminding device comprising

(a) an elastic strap-like body portion arranged to be supported on a person's wrist,

(b) mounting means on the ends of said body portion arranged to hold said device on the wrist in tensioned relation,

(c) a plurality of tabs mounted on said body portion having top and bottom edges,

(d) said tabs having a laterally extending opening receiving said body portion,

(e) said laterally extending opening being located between said top and bottom edges of said tabs,

(f) the tab portion above said openings having a surface area arranged to receive a reminding message thereon,

(g) the tab portion below said openings forming a tongue arranged to have bottom edge engagement with the wrist,

(h) said tabs being tiltable in one direction or the other by the forceful engagement of their bottom edges against the wrist as a result of the elasticity of said body portion whereby said tabs can be moved manually to one tilted position which may comprise an indicating position or the other tilted position which may comprise a non-indicating position.

4,179,834

FISHERMAN'S LEADER CADDY

Harold A. Thomas, 363 Poplar Fork Rd., Scott Depot, W. Va. 25560, assignor to Harold A. McClung and Harold A. Thomas, both of Scott Depot, W. Va.

Filed Dec. 14, 1977, Ser. No. 860,481

Int. Cl.[2] **A01K** *97/06*

U.S. Cl. 43—57.5 R **5 Claims**

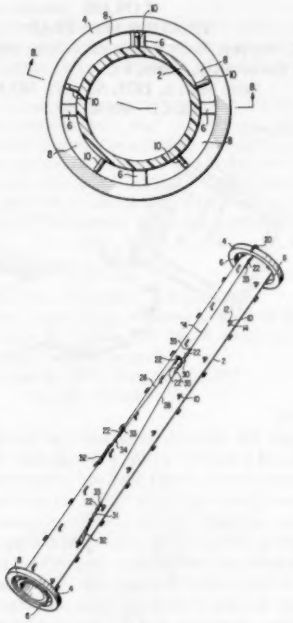
1. A fishing leader caddy for storing and transporting fishing leaders having multiple leader elements wherein at least one leader element includes a fishing hook and said multiple leader elements are connected to each other, said fishing caddy comprising:

an elongated cylindrical hollow tube having two ends,

flange means for attaching fishing hooks to said caddy, said flange means comprising a pair of annular flange members connected to respective ends of said tube, and plural radial connecting members connecting respective of said annular flange members to the respective tube ends, said flange members spaced apart from the respective tube ends by said radial connecting members such that said fishing hook can be hooked on said annular flange members,

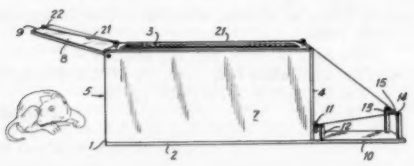
a plurality of caddy hooks imbedded in said elongated tube, said caddy hooks disposed at predetermined intervals

along the length and around the periphery of said hollow elongated tube, and



resilient fastening means for attaching said multiple leader elements to said caddy hooks, and for maintaining said leader elements taut.

4,179,835
SMALL ANIMAL TRAP
Robert F. Hunter, 119 Bowie St., Abbeville, S.C. 29620
Filed Sep. 21, 1978, Ser. No. 944,295
Int. Cl.[2] A01M *23/18*
U.S. Cl. 43—61 **1 Claim**



1. A small animal trap having a cage with a bottom, a top, a back, an open front and sides joining the top, bottom and back, said small animal trap comprising:

a trap door hingedly affixed to the top of the cage at the front thereof, said trap door having a front bottom edge;

a support member extending beyond the back of said cage substantially coplanarly with the bottom thereof;

a first pair of spaced parallel posts extending substantially perpendicularly from the support member at a predetermined distance from the back of the cage and a predetermined distance from each other;

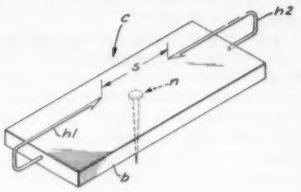
a second pair of spaced parallel posts extending substantially perpendicularly from the support member at a greater distance from the back of the cage than the predetermined distance and having a cross bar affixed thereto and extending therebetween substantially parallel to said support member and spaced thereabove;

a lever pivotally mounted in the back of said cage at the center of the lever and balanced therein, said lever having a first end in the cage with a tray thereon for bait and a spaced opposite second end movably positioned between the first pair of posts;

a trip rod having a length longer than the predetermined distance between said firt pair of posts and resting on said lever between said posts and said cage; and

a cord having a first end affixed to the front bottom edge of said trap door and a spaced opposite second end affixed to the center of said trip rod, said cord being guided along the top of said cage and around said cross bar in a manner whereby said trap door is held open and when an animal depresses the first end of said lever by taking the bait, the second end of said lever moves upward and knocks said trip rod free thereby slackening the cord so that said trap door is released and closed.

4,179,836
MOLE CATCHER
Herbert J. Clark, Midland, Mich., assignor to Thresher Institutes, Incorporated, Midland, Mich.
Continuation of Ser. No. 623,830, Oct. 20, 1975, abandoned.
This application Aug. 15, 1977, Ser. No. 824,946
Int. Cl.[2] A01M *23/30*
U.S. Cl. 43—77 **1 Claim**



1. As an article of manufacture, a device for catching moles and other vermin comprising:

(a) a generally rectangular and flat base;

(b) a pair of hooks secured on said base, each of said pair of hooks of hooks (b) being generally of the fish hook-sort; with each accordingly having

(c) a non-cutting shank portion; and

(d) a bent over-and-back hook portion extension of said shank portion (c) that is free from lateral cutting edges, with said hook portion terminating in and with

(e) a sharp-pointed and barbed tip at the free end of said hook portion (d), with

said hooks (b) thus being further generally characterized in being entirely free of any running edge surface(s) thereupon that are capable of cutting and slicing save for the pointed sharp end of said barbed tip portion (e) of each,

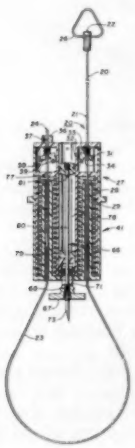
said pair of hooks (b) being respectively individually and separately fixed flatly one at each end of said base (a) with and by their respective shank portions (c) towards and on the respectively opposite narrow ends of the base (a);

each of said pair of hooks (b) being disposed on the base (a) with the hook portions (d) thereof raised upwardly over the base (a) and with their respective tips (e) opposed to and pointed towards one another and coincident therewith; so that

each of said hook tips (e) in said pair of hooks (b) extends outwardly from respective longitudinal ends of said base (a) so as to be postured with hook portion(s) (d) going up-and-over the end edge(s) of the base (a) then back-over the top of said base with non-cutting shank

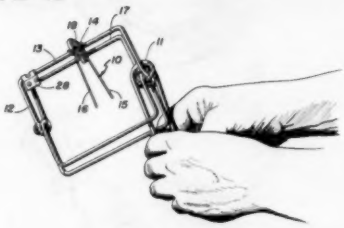
and non-cutting and -slicing curled-over hook portion(s) (d) exposed in elevation over said base; with
each of said barbed hook tips (e) also being respectively and individually pointed towards the central part of said base (a), in which direction
the shank portions (c) of the pair of hooks (b) are set upon the base (a) in a line that is at least approximately parallel with the longitudinal center line of said base (a) while standing upright with respect to said base; with
only said sharp-pointed barbed tips (e) of each of said pair of hooks (b) being capable of impaling and in any way cutting for catching objects moving thereon and thereagainst when said objects move in a path of travel coincident with the end-to-end longitudinal center line of said base (a) and in said path against the direction in which either of said barbed tips (e) are pointed:
said pair of hooks being so fixed on the base (a) that the hooking tips (e) of each of said pair of hooks (b) are so positioned and disposed that the tip-to-tip spacing between said oppositely-pointing pair of hooks (b) is between about 1½ and about 6 inches and,
in any given instance, on an order of spacing that is at least approximately half the length of said base (a); plus
(f) spike means adapted to anchor said device in and with ground when it is placed for use, said spike means (f) being nail-like appendages protruding downwardly from and fixed to said base (a).

4,179,837
ANIMAL TRAP
Henry E. Gummeringer, 8609 Lyndale Ave. South, Ste. 101A, Bloomington, Minn. 55420
Filed Jan. 11, 1978, Ser. No. 868,709
Int. Cl.[2] H01M *23/34*
U.S. Cl. 43—87 **14 Claims**



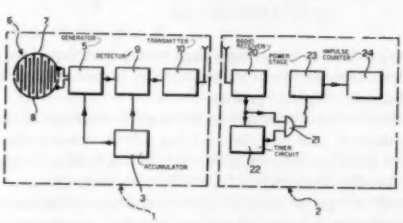
1. An animal trap comprising a snare housing assembly for connection to a snare cable which has first and second ends with an anchor portion at the first end and a snare portion at the second end, the assembly including a snare housing having a guide passage for sliding connection of the housing on the anchor portion of the cable, the snare housing also having a connection for the second end of the cable and thereby providing a snare loop in the cable between said second end connection and said guide passage with the snare housing serving as a slip knot during normal self-tightening of the snare, the snare housing also having a settable and releasable spring member movably mounted thereon together with mechanism for operatively connecting the spring member to the snare cable for quick tightening of the snare loop in response to release of the spring member, and said trap having a trigger device operatively connected to the spring member for releasing the spring member in response to actuation of the trigger by an animal.

4,179,838
TRIGGER FOR TRAP
Joseph C. Harvey, West Yarmouth, Mass., assignor to Woodstream Corporation, Lititz, Pa.
Filed Mar. 6, 1978, Ser. No. 883,800
Int. Cl.[2] A01M *23/24*
U.S. Cl. 43—92 **4 Claims**



1. Trigger for use with an animal trap having first and second jaws and a dog for setting the trap, said dog being pivotally mounted on one of said jaws and being engagable with the other of said jaws to hold the trap in set condition, said trigger fitting onto said other of said jaws for releasing the dog when the trigger is moved by an animal, said trigger comprising a single piece of rod material shaped to define a pair of elongated legs and a head connecting said legs, said head including first and second arcuate portions ajoining the respective legs and a third portion connecting said first and second arcuate portions, said head fitting over said other of said trap jaws with said first and second arcuate portions on one side of the jaw, with said third portion on the opposite side of the jaw and with said dog when engaged with the jaw being located between said first and second arcuate portions, said head including contact points on said opposite sides of the jaw for engaging the dog when the trigger is moved to release the dog and spring the trap.

4,179,839
DEVICE FOR KEEPING UNDER CONTROL THE POPULATION OF SELECTED SPECIES OF INSECTS
Gianfranco Salotti, Avigliana; Elvio Ferrero, and Franco Grisotto, both of Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy
Filed Apr. 12, 1978, Ser. No. 895,554
Claims priority, application Italy, Apr. 12, 1977, 67800 A/77
Int. Cl.[2] A01M *1/22;* **G07C** *11/00*
U.S. Cl. 43—112 **4 Claims**



1. A device for use in keeping insect infestations under control, said device comprising:
at least one trap,
electrical conductor means on said at least one trap,
a high tension generator,
said electrical conductor means being connected across the

output of said high tension generator and being so formed as to produce an electrical discharge when an insect above a given size comes into contact with the said electrical conductor means,

radio transmitter means,

discharge detector means operable to detect electrical discharges across said electrical conductor means and to enable, in response thereto operation of said radio transmitter means,

radio receiver means for receiving signals transmitted by said radio transmitter means, and

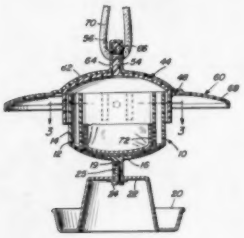
an impulse counter means connected to the output of said radio receiver means, said impulse counter means operating to count each time said transmitter means is operated, whereby to provide an indication, at a location remote from said trap, of the number of insects trapped thereby.

4,179,840

HANGING INSECTICIDE DRUM

Herbert G. Sandefur, Maud, Okla., assignor to Kenneth Kienzle, Jr.; Gary Jay; John L. Clifton and Joe B. Womack, all of Shawnee, Okla., part interest to each

Filed Jul. 6, 1977, Ser. No. 813,547
Int. Cl.[2] A01M *1/20*
U.S. Cl. 43—131 **3 Claims**



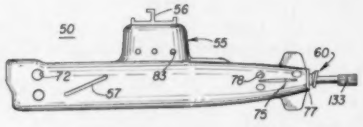
1. An insect attracting, insecticide containing and insect exterminating and disposing drum expressly adapted to be swingably hung and suspended from a suitable support, said drum comprising an upwardly opening cup-like receiver including upstanding peripheral wall portions and closed at its lower end by means of an upwardly opening perforated and partial spherical cotton wall extending between and formed integrally with said peripheral wall portions, the central portion of said bottom wall including a depending mounting shank, an internal upstanding tubular insecticide container disposed within said receiver, open at its upper and lower ends and including spaced peripheral wall portions spaced inwardly from opposing wall portions of said receiver for air circulation upwardly through said bottom wall, the spaces defined between opposing wall portions of said receiver and container, over the upper end of said container and downwardly through said container and the bottom wall inwardly of the receiver peripheral wall portions, a downwardly opening cover telescoped downwardly over the upper end of said receiver and removably anchored relative thereto, said cover including a top wall spaced above the upper end of said container, an upwardly opening insect and insecticide drop catching pan supported from the lower end of said stud, said pan including a bottom provided with a raised cental portion underlying at least the central portion of said bottom wall inwardly of said container peripheral portions, means removably anchoring said raised central portion to said stud with the lower end of said stud opposing said raised central portion, a downwardly opening shield having a central portion closely overlying, conforming to and supported from the upper surface of said cover and an outer peripheral portion extending about said shield central portion and projecting outwardly beyond all sides of said drum and said pan, said shield central portion including an upwardly projecting and downwardly opening hollow lug, said cover including an upwardly projecting hanger flange snugly removably received in said hollow lug, said hollow lug and hanger flange having registered rope accommodating horizontal openings formed therein.

4,179,841

TOY OBJECT THAT PROPELS FORWARD, SUBMERGES AND SURFACES

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed Nov. 14, 1977, Ser. No. 850,948
Int. Cl.[2] A63H *23/04*
U.S. Cl. 46—94 **9 Claims**



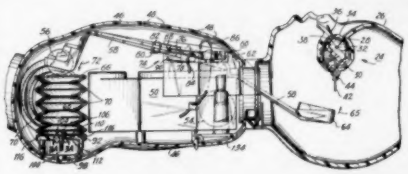
1. A toy object comprising a body having a ballast chamber and a buoyant air chamber, said chambers being non-communicating with respect to each other and dimensioned such that normally said body floats in water with a portion of said body extending out of the water, said body being formed of separate substantially hollow nesting members with each member forming a portion of said ballast and buoyant chambers, said nesting members frictionally engaging one another to form said chambers, diving planes extending outwardly from said body angularly disposed to the horizontal when said body floats such that forward movement of said body through the water causes said body to submerge, and motor means associated with said body having a propeller extending outwardly of said body and having an energy storage device connected to said propeller for causing same to rotate, rotation of said propeller causing forward movement of said body through the water and simultaneous submerging of said toy object below the water surface until said propeller ceases to rotate when said body rises until said portion extends out of the water.

4,179,842

AUDIBLE SOUND EMITTING TOY

Thomas J. Fauls, West Orange, N.J., assignor to Mego Corp., New York, N.Y.

Filed Aug. 26, 1977, Ser. No. 827,933
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—117 **11 Claims**



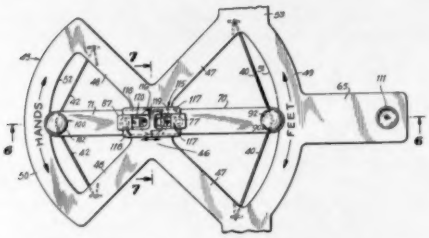
1. A doll capable of emitting different sounds in each of at least two orientations of which a first orientation of the doll is an upright vertical position and a second orientation of the doll is a reclining horizontal position comprising an enclosure constituting at least a portion of the doll and having a hollow interior and a foraminous portion communicating said interior with the exterior of the doll; means in said hollow interior for emitting sounds, including at least two sections each operative for emitting the sounds associated with one of the orientations; and means for controlling the operation of said emitting means in dependence on the orientation of the doll, including a weight so mounted in said hollow interior as to be gravitationally displaced toward a different position relative to said enclo-

sure in each of the orientations, switch means including a control portion attached to said weight for movement therewith and operative for energizing a different one of said sections of said emitting means in each of said positions of said weight, and time-delay means for retarding the displacement of said weight toward at least one of said positions thereof and for delaying the energization of the corresponding section of the emitting means upon change of the orientation of the doll by a finite time interval, said emitting means simulating sounds of giggling when the doll is in the upright vertical position and crying when in the reclining horizontal position.

4,179,843
CONTROLLER WITH INDIVIDUALLY OR SIMULTANEOUSLY MOVABLE ARMS

Yin F. Ho, Kowloon, Hong Kong, assignor to Madison Ltd., Hackensack, N.J.

Filed Nov. 1, 1977, Ser. No. 847,562
Int. Cl.[2] A63H *7/00*
U.S. Cl. 46—126 **11 Claims**

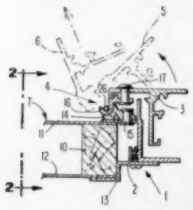


1. A puppet controller for a puppet having movable hands and feet, said controller comprising a frame for manual holding and manipulation, a first arm mounted on said frame for movement relative to the latter and connectible to the puppet feet for animating the same, a second arm mounted on said frame for movement relative to the latter independently of said first arm and connectible to the puppet hands for actuation thereof, constraining means mounted on said controller frame and selectively associated with said first and second arms to constrain each said arm to movement only with the other relative to said frame for simultaneous animation of said feet and hands.

4,179,844
HINGE

Paul R. Steuer, Cheltenham, Pa., assignor to Young Windows Inc., Conshohocken, Pa.

Filed Jun. 30, 1978, Ser. No. 920,651
Int. Cl.[2] E05D *1/06, 7/10*
U.S. Cl. 16—171 **3 Claims**

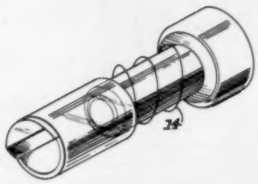


1. A hinge to be connected between two parts and provide for relative rotation of the same and to hold the parts so as to avoid rattle and at a predetermined rotational position to permit the parts to be separated, the hinge comprising:
- a first elongated member having means for connecting the same to one of the parts to be rotated and having spring retaining means;
- a second elongated member having means for connecting the same to the other of the parts to be rotated and having spring retaining means;
- means on one member forming a semi-circular concave surface;
- means on the other member forming a semi-circular convex surface, the surfaces slidingly engaging one another; and
- wire-form spring means elongated and generally rectangular in shape and having a pair of spaced apart compression sections extending along the lengthwise direction of the spring means and having end sections respectively extending between the compression sections and closely adjacent opposite edges of said members and preventing axial separation of the members, one compression section engaging said spring retaining means on said first member and the other compression section engaging said spring retaining means on second member and the sections developing forces urging the convex and concave surface towards one another, said surfaces and said forces providing for the surfaces to tightly and slidingly engage without separation to thereby avoid rattle and for the members to relatively rotate over a predetermined arc without separation and for the surfaces to be separated by movement of the members in a radial direction at one end of the arc whereby to separate the members.

4,179,845
TUBE TYPE DIAPHRAGM GAME CALL

Bart M. Jacob, Box 2, Bondville, Vt. 05340

Filed Jul. 25, 1977, Ser. No. 818,924
Int. Cl.[2] G10K *9/02*
U.S. Cl. 46—178 **6 Claims**



1. A tube type diaphragm game call comprising
- a first tube having a diaphragm end half closed off and a portion not closed off and an open end, and
- a second tube having a portion located within and coaxial with said first tube,
- said second tube having a first end within said first tube, said second tube being slidable within said first tube so that said first end may stop at said diaphragm end of said first tube,
- said second tube having a second end projecting from said first tube for manipulation by the hand to slide said second tube within said first tube to vary the sound produced by said game call.

4,179,846
HORTICULTURAL DEVICES

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

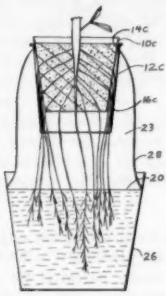
Filed Sep. 27, 1977, Ser. No. 836,978
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—59 **10 Claims**

1. The method of hydroponic plant culture, including steps of
- planting a seed in particulate plant-growing material in a first container containing such material, said first container having a side wall and a bottom of yieldable fibrous material both of which accommodate root penetration and enlargement of root cross-section but which are essentially free of through openings penetrable by the particu-

late plant-growing material and the transverse dimensions of the first container being so limited in relation to the plant as to be readily accessible for penetration by laterally growing roots;

supporting said first container above hydroponic liquid in a hydroponic liquid container with the side wall of the first container spaced from surrounding root-confining means and with the bottom of the first container spaced above and freely exposed to nutritive hydroponic liquid in the hydroponic liquid container;

maintaining the space about the sides and bottom of the first container and above the liquid largely sealed for developing substantially 100% humidity in that space and maintaining the particulate material suitably moist while the



seed germinates and while the resulting seedling develops a stem having a downward extension in the particulate material for inducing development of roots extending downward and through the bottom of said first container and for additionally inducing development of roots sidewise from said downward extension projecting outward to and through said side wall of the first container at a range of depths in the particulate material starting just under the surface thereof, thereby to develop outward-extending anchored supports for the plant at a range of depths in the particulate material and through the side wall of the first container; and

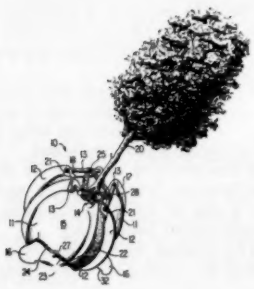
after such root development has occurred, continuing the development of the plant hydroponically by utilizing said nutritive hydroponic liquid and said 100% humidity.

4,179,847

ROOT BALL CLAMP

Jean-Pierre F. Osterwalder, 812 Cottage St., Vienna, Va. 22180

Filed Jul. 20, 1978, Ser. No. 926,381
Int. Cl.[2] A01G *23/04, 23/06*
U.S. Cl. 47—76 **5 Claims**



1. A root ball clamp system for protecting, surrounding and clamping the root ball portion of a tree, comprising:

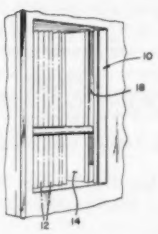
a plurality of plate members, each of said plate members being curved inwardly from its top edge to its lower edge and also curved inwardly from its longitudinal sides, each plate member having a foot portion at the lower end thereof which extends outwardly and downwardly from the general plane of the plate member and which acts as a base in conjunction with similarly shaped foot portions of the other plate members, each plate member having a raised reinforcing rib extending outwardly on each longitudinal side of the plate member, each of said reinforcing ribs being substantially perpendicular to the general plane of the plate member and extending upwardly beyond the top edge of said plate member, a tie bar spaced from and extending laterally across the upper end of each plate member, said tie bar being attached at each end to one of said re-inforcing ribs which extend upwardly beyond the top edge of said plate member, means extending around the periphery of said plate members at the lower ends thereof for securing the lower ends of said plate members about the root ball portion of a tree, said securing means extending upwardly over the foot portion of each plate member, and means for connecting the tie bars of said plate members to secure the upper ends of said plate members about the root ball portion of the tree.

4,179,848

RESTRAINING APPARATUS FOR BOOKCASES

Richard F. Gauron, 26020 SE. 158th St., Issaquah, Wash. 98027

Continuation-in-part of Ser. No. 878,754, Feb. 17, 1978, abandoned. This application Sep. 27, 1978, Ser. No. 946,177
Int. Cl.[2] E06B *11/00*
U.S. Cl. 49—124 **10 Claims**



1. A restraining apparatus for an open access storage compartment in moving vehicles comprising in combination:

(a) a first and a second rail, each substantially vertically mounted at said associated compartment vertical sides adjacent said compartment access opening;

(b) a first and a second guiding member slidingly disposed in said first and said second rail member respectively;

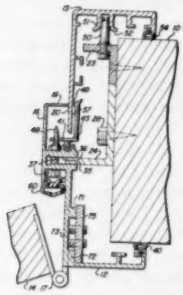
(c) a restraining bar substantially horizontally located between said first and said second rail and connected at each end to said first and said second guiding member respectively; and

(d) a spring located inside of said restraining bar for providing a predetermined force to said first and said second guiding members, disposed in said first and said second rail, for obtaining a non-vibrating arrangement and a controlled sliding pressure inside of said first and said second rail, whereby said restraining bar is adapted to move manually horizontally upwards and upon manual release horizontally downwards in a speed controlled fashion.

4,179,849
DOOR FRAME ASSEMBLY

Reinhold O. Kuffner, Karlsruhe, Fed. Rep. of Germany, assignor to Kueffner Products, Inc., Phoenix, Ariz.

Filed Mar. 2, 1978, Ser. No. 882,935
Int. Cl.[2] E06B 1/04
U.S. Cl. 49—505 9 Claims

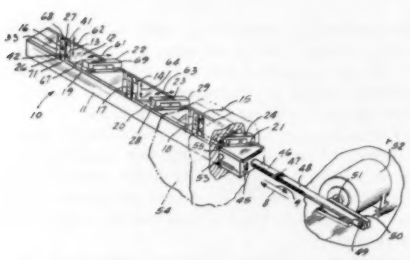


1. A door frame assembly including in combination:
a first elongated part of uniform generally L-shaped cross section and having anchor gripping means integrally formed therewith;
a second elongated part of uniform generally L-shaped cross section and having anchor gripping means integrally formed therewith;
one of said first and second parts having a door stop extension thereon adapted to overlap the other of said first and second parts when said parts are placed on opposite sides of a door opening and moved toward one another; and
an L-shaped clamping lever pivotally attached to said one of said first and second parts for engagement with said other of said first and second parts on the opposite side of said other of said parts from the side overlapped by the door stop extension of said one of said parts.

4,179,850
REACTION HONING TOOL FOR HONING A FLAT SURFACE

Robert H. Gillette, Angola, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Apr. 19, 1978, Ser. No. 897,937
Int. Cl.[2] B24B 7/00
U.S. Cl. 51—59 R 26 Claims

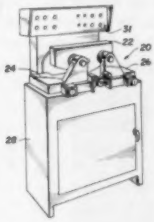


1. A reaction honing tool for honing a flat surface of a workpiece comprising:
a body member movable in a longitudinal direction; first means for honing mounted on said body member so as to move back and forth, relative to said body member, due to reaction forces, which result from a change of motion, from a first direction to an opposite direction, of the body member; said first means for honing being oriented at a first angle with respect to said first direction;
said first angle being between 0° and 90°.

4,179,851
APPARATUS FOR EDGING OPHTHALMIC LENSES

Boyd L. Neisler, and Joe D. Stith, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Jan. 24, 1978, Ser. No. 871,871
Int. Cl.[2] B24B 9/14, 1/00
U.S. Cl. 51—101 LG 6 Claims



1. An apparatus for grinding an edge configuration upon ophthalmic lenses comprising:
abrading wheel means mounted for rotation about a first horizontally extending axis;
means connected to said abrading wheel means for rotating said abrading wheel means about said first axis;
first means for rotatably mounting a first lens to be edge ground about a second horizontal axis extending parallel to said first axis, said first means for rotatably mounting including,
first means for translating said second parallel axis in a horizontal plane toward and away from said first axis for selectively engaging a peripheral portion of the first lens with a peripheral portion of said abrading wheel means said first means for translating including,
first head means mounted upon one side of said abrading wheel for translation in an X–Y coordinate horizontal plane toward and away from said axis of said abrading wheel means, and
a first lens chucking assembly for securely holding a first lens and being journaled at the ends thereof within a pair of opposing stanchion means mounted upon said first head means;
second means for rotatably mounting a second lens to be edge ground about a third horizontal axis extending parallel to said first axis, said second means for rotatably mounting including,
second means for translating said third parallel axis in a horizontal plane toward and away from said first axis for selectively engaging a peripheral portion of the second lens with another peripheral portion of said abrading wheel means said second means for translating including,
second head means mounted upon the other side of said abrading wheel for translation in an X–Y coordinate horizontal plane toward and away from said axis of said abrading wheel means, and
a second lens chucking assembly for securely holding a second lens and being journaled at the ends thereof within a pair of opposing stanchion means mounted upon said second head means;
first means for rotating the first lens about said second axis;
second means for rotating the second lens about said third axis;
motor means connected to said first and second head means for selectively translating said first and second head means in an X–Y horizontally planar coordinate toward and away from abrading wheel, said motor means includes

means for biasing said first and second head means toward said abrading wheel and said first and second lenses into engagement with the periphery of said abrading wheel upon generally opposite sides of said abrading wheel; and

means operably connected to said first and second means for rotatably mounting said first and second lenses for controlling the angular orientation and radial position of the first and second lenses relative to said abrading wheel means in accordance with a desired peripheral configuration of the first and second lenses, said means for controlling including,

single pattern means mounted for rotation upon a fourth axis lying parallel to said first, second and third axis, first switch contact means mounted adjacent said pattern means,

means connecting said first switch contact means to said means for rotating said first lens for controlling rotation of said first lens upon engagement of said switch contact means with said pattern means,

second switch contact means mounted adjacent said pattern means, and

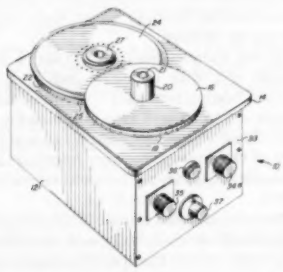
means connecting said second switch contact means to said means for rotating said second lens for controlling rotation of said second lens upon engagement of said switch contact means with said pattern means.

4,179,852

METHOD AND APPARATUS FOR POLISHING FLOPPY DISCS

David L. Barnett, Phoenix, Ariz., assignor to Three Phoenix Company, Phoenix, Ariz.

Filed Mar. 13, 1978, Ser. No. 885,625
Int. Cl.[2] B24B *5/00, 1/00*
U.S. Cl. 51—132 **21 Claims**



1. A method of polishing an annular region of the recording surface of an annular flexible recording element to improve the surface smoothness, said method comprising the steps of:

(a) supporting the recording element on a resilient surface capable of transmitting sufficient torque to said recording element to rotate said recording element about a first axis of rotation without significant slippage;

(b) supporting a flat, circular polishing disc by means of a disc-shaped platen such that the recording surface of said recording element is exposed to said polishing disc, the radius of said polishing disc exceeding the width of the annular region of said recording surface, said polishing disc having a second axis of rotation parallel to said first axis;

(c) moving a flat surface of said polishing disc into contact with the annular region of said recording element such that the contact is maintained by a predetermined force, the radial extent of the annular region being defined by the extent of the contact;

(d) rotating said recording element about said first axis and said polishing disc about said second axis in the same angular direction at first and second predetermined angular velocities, respectively, for a predetermined period of time, said first and second predetermined angular velocities being selected to produce approximately uniform relative velocity differences between points of the recording surface of said recording element and adjacent points of the flat surface of said polishing disc, said points of the recording surface lying along a line passing through the axes of rotation of the disc-shaped platen and the polishing disc; and

(e) moving said polishing disc away from said recording element to permit removal of said recording element from the resilient surface.

12. A machine for polishing an annular region of a recording surface of an annular flexible recording element to improve the surface smoothness, said machine comprising in combination:

(a) a resilient surface capable of transmitting sufficient torque to said recording element to rotate said recording element without significant slippage;

(b) first means for supporting the non-recording surface of the recording element on said resilient surface, said first means having a first axis of rotation;

(c) a flat, circular polishing disc;

(d) second means for supporting said polishing disc such that the recording surface of said recording element is exposed to said polishing disc, the radius of said polishing disc exceeding the width of the annular region of said recording surface, said second means having a second axis of rotation parallel to said first axis;

(e) third means for moving a flat surface of said polishing disc into overlapping contact with the annular region of said recording element such that the overlapping contact is maintained by a predetermined force, the radial extent of the annular region being defined by the extent of the overlapping contact;

(f) fourth means for rotating said first means and said second means so that said recording element and said polishing disc rotate in the same angular direction at first and second predetermined angular velocities, respectively, for a predetermined period of time, said first and second predetermined angular velocities being selected to produce approximately uniform relative velocities between points of the recording surface of said element and adjacent points of a flat surface of said polishing disc, said points of the recording surface lying along a line passing through said first and second axes of rotation, respectively; and

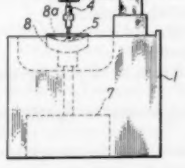
(g) fifth means for moving said burnishing disc away from said recording element to permit removal of the recording element from the resilient surface.

4,179,853

CONTROLLING DEVICE FOR GRINDING PIEZO-ELECTRIC ELEMENT

Nakanobu Moritani, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Sep. 7, 1977, Ser. No. 831,275
Int. Cl.[2] B24B *49/10*
U.S. Cl. 51—165 R **4 Claims**



1. Controlling device for grinding piezo-electric elements comprising:

grinding apparatus for grinding a piezo-electric element to obtain a desired natural frequency,

two band-pass filters of which one has a central frequency of

the band which is lower than the desired natural frequency of said piezo-electric element and the other has a central frequency of the band which is higher than the desired natural frequency of said piezo-electric element, said filters having equal damping characteristics at the desired natural frequency of said piezo-electric element,

means for detecting an electric signal from the piezo-electric element being ground including as a frequency component the natural frequency of said element and feeding said signal to an input of each of said band-pass filters,

means for converting the output of each of said two band-pass filters to a dc voltage,

comparator means receiving said dc voltages from said converting means and detecting whether or not said dc voltages coincide, and

means for stopping the grinding of said piezo-electric crystal by said grinding apparatus in response to a predetermined signal from said comparator means.

4,179,854

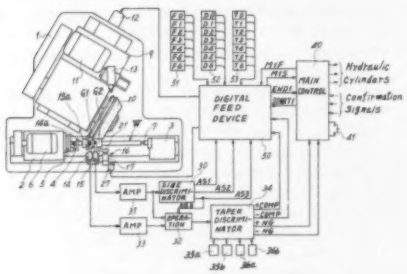
GRINDING MACHINE WITH REST APPARATUS

Kenichi Munekata, Kariya; Takeshi Ohta, Aichi, and Susumu Ohshima, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 18, 1978, Ser. No. 925,878

Int. Cl.[2] B24B *49/04*

U.S. Cl. 51—165.77 **5 Claims**



1. A grinding machine for grinding a workpiece comprising:

a bed;

means mounted on said bed for rotatably supporting said workpiece;

first drive means for rotating said workpiece;

a wheel head slidably mounted on said bed for rotatably supporting a grinding wheel thereon;

second drive means for rotating said grinding wheel;

a first servomotor for moving said wheel head so as to move said grinding wheel toward and away from said workpiece;

a rest apparatus comprising a pair of rest shoes movable toward said workpiece to support the same;

a second servomotor for moving said rest shoes;

means for measuring a diametral dimension of a workpiece during a grinding operation;

a main control circuit for sequentially enabling an automatic grinding operation;

first presetting means for digitally presetting variety of feed amounts;

second presetting means for digitally presetting a variety of feed speeds;

a digital feed device responsive to said measuring means and said main control circuit for selectively selecting one of the feed speeds preset in said first presetting means and one of the feed amounts preset in said second presetting means to cause one of said first and second servomotors to move one of said wheel head and said pair of rest shoes at a selected feed speed through a selected feed amount;

means for calculating a taper amount of a workpiece ground under the support of said rest shoes being positioned at their advanced positions at the time when said measuring means generates a signal for finishing a grinding operation on said workpiece; and

means responsive to said calculating means for compensating for advanced positions of said rest shoes for a next grinding operation.

4,179,855

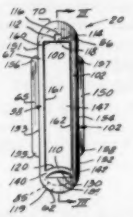
INSERT FOR HONING TOOL

Robert H. Gillette, Angola, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Apr. 24, 1978, Ser. No. 898,924

Int. Cl.[2] B24B *33/00*

U.S. Cl. 51—204 **6 Claims**



1. An improved insert for a honing tool comprising: a one piece body,

said body having two parallel elongated side members in spaced relation to one another,

a top member joining said two parallel side members, a bottom member having a first and a second end and joining said two parallel side members;

said two parallel side members, said top member and said bottom member forming an aperture wherein a honing stone can be inserted;

a curved spring member molded into said body at a first end and a second end with said first end of said spring being molded to said body where said first end of said bottom member intersects a first of said two side members and with said second end of said spring being affixed to said body where said second end of said bottom member intersects a second of said two side members and having a central region that extends into said aperture;

said central region of said spring member being movable independently of said body and operable to clamp the honing stone within the aperture against said top member as that honing stone is slid within said insert by the tool; and retaining means operative to retain said insert in a tool into which it has been inserted.

4,179,856

SANDING SLEEVE ASSEMBLY

John H. Wheeler, Dallas, Tex., assignor to The Texacone Company, Dallas, Tex.

Continuation-in-part of Ser. No. 721,984, Sep. 10, 1976, Pat. No. 4,089,137. This application Dec. 29, 1977, Ser. No. 865,708

The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.

Int. Cl.[2] B24B *19/00*; B24D *3/22*

U.S. Cl. 51—241 S **21 Claims**

1. A sleeve assembly for sanding a piston rod in a hydraulic cylinder or the like having a stuffing box, which comprises:

an annular outer member comprised of a rigid material having first and second sections which engage to surround the piston rod;

an annular intermediate member comprised of an elastomeric material having first and second sections adhesively secured to the inner surfaces of the first and second sections of the outer member;

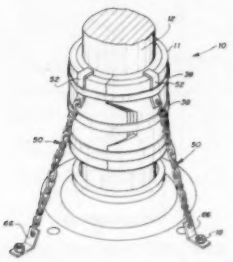
An annular abrasive inner member having first and second

sections adhesively secured to the inner surfaces of the first and second sections of the intermediate member for interference contact with the piston rod;

the first and second sections of the annular members each having first and second end portions with opposed complementary non-axial configurations such that the sleeve assembly does not score the piston rod during axial movement therebetween while sanding the piston rod;

at least one hose clamp means surrounding the annular outer member for releasably engaging the first and second sections of each of said annular members;

the annular outer member including a like number of peripheral grooves each for receiving one of the hose clamps therein;



at least two chain means each having first and second ends for extending between the annular outer member and the stuffing box for releasably securing the sleeve assembly to the hydraulic cylinder whereby relative movement between the piston rod and the sleeve assembly is affected by translation of the piston rod;

at least two bracket means affixed to said annular outer member, each of said bracket means releasably receiving the first end of one of said chain means;

each of said brackets having a portion extending along the annular outer member and an end portion turned to engage a predetermined portion of the sanding sleeve assembly; and

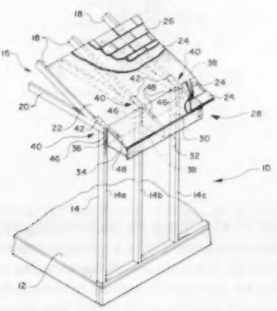
means for releasably affixing the second end of each of said chain means to the stuffing box.

4,179,857

HINGED EAVE ASSEMBLY FOR A STRUCTURE

Tiras J. Danford, Quitman, Ga., assignor to Harrington Manufacturing Company, Lewiston, N.C.

Filed Jun. 26, 1978, Ser. No. 919,169
Int. Cl.[2] E04B *7/16*
U.S. Cl. 52—71 **6 Claims**



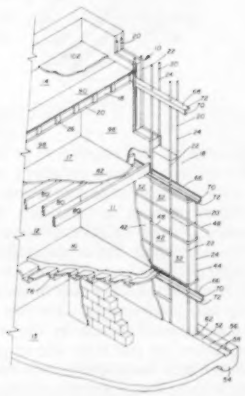
1. In a hinged eave-roof assembly of a structure of the type where the eave comprises a top, an inboard side and an outboard side and is movable between a transport position overlying the roof to a normal functional extended position where the eave appears to be a normal extension of the roof, the improvement comprising: a metal hinge for hingedly connecting said eave to the roof structure with the metal hinge being split longitudinally about one end thereof so as to divide one end of said hinge into two distinct sections, and wherein one of the split sections is bent so as to form an angle of less than 180 degrees with the other split section, and wherein opposite said split sections a roof attaching portion is defined and fastened to said roof while the bent split section lies adjacent to and is fastened to the inboard side of said eave and the other split section lies adjacent to and is fastened to the top of said eave, whereby said eave can be moved back and forth between said transport and extended positions by the bending and flexing of the metal hinge above an area between the roof attaching position and the split sections and wherein the eave is securedly held within the hinge by the two split sections and securedly held adjacent the roof structure by the interconnection formed by the hinge extending between said roof and eave.

4,179,858

BUILDING STRUCTURE AND METHOD OF CONSTRUCTION

Douglas L. Graham, R. R. 2, Auburn, Ind. 46706, and Mark L. Graham, 6912 Ludwig Cir., Fort Wayne, Ind. 46825

Filed Apr. 8, 1977, Ser. No. 785,875
Int. Cl.[2] E04B *1/00; E04B 7/00*
U.S. Cl. 52—262 **23 Claims**



12. A building structure comprising a plurality of spaced-apart stud members, said stud members defining interstitial spaces therebetween each having a thickness generally equal to the width of said studs, said spaces each having a length generally equal to the length of said studs and a width generally equal to the spacing between said studs, said spaces each being filled with at least one generally rectangular block of self-supporting material thereby defining a column of said material between each adjacent pair of said studs having a shape generally corresponding to said spaces, means extending between alternate studs for connecting said studs and columns together into a load bearing structure, a foundation, means for connecting said studs to said foundation, said studs and said columns upstanding from said foundation thereby forming a wall, said wall having a roof support connected thereto, and a roof resting on said roof support and supported by said wall, said roof comprises a plurality of spaced-apart stud members, said stud members defining interstitial spaces therebetween each having a thickness generally equal to the width of said studs, said spaces each having a length generally equal to the length of said studs and a width generally equal to the spacing between said studs, said spaces each being filled with one or more

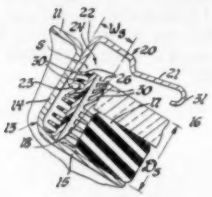
generally rectangular blocks of self-supporting material thereby defining a column of said material between each adjacent pair of said studs having a shape generally corresponding to said spaces, means extending between alternate studs for connecting said studs and columns together into a load bearing roof structure, said stud members comprise a pair of spaced-apart and generally parallel rods secured together at spaced-apart intervals by a plurality of spacers, said roof support comprises an angle member having two flanges disposed generally perpendicularly to each other, one of said flanges being supported by and resting on said spacers, the other of said flanges having spaced-apart apertures therein, the spacing of said apertures being generally the same as the spacing of said roof studs, one rod of each of said roof studs being positioned in each of said apertures.

4,179,859

MOLDING RETAINING CLIP

John J. Fricko, Harper Woods, and George M. Newton, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1978, Ser. No. 932,000
Int. Cl.[2] E04F *19/02*
U.S. Cl. 52—397 **3 Claims**



1. A molding retaining clip adapted to be inserted and self-retained within a space between a periphery of a window and an imperforate vehicle body flange supporting the window and defining the window opening, said molding clip comprising a waved strip formed of resilient material having a plurality of waves spaced along its length and extending across its width, a plurality of integral projections on opposite sides of said waved strip projecting from the concave side of each of said waves, said waved strip being squeezably insertable lengthwise into the space and then retained therein by the waves urging the ends of the projections on one strip side to grip the window periphery and the ends of the projections on the other strip side to grip the vehicle body flange and whereafter upon forceable insertion of a molding flange with a reverse bent end between said strip and the body flange opening, the projections on said other strip side after deflecting to permit the molding flange insertion then assume end gripping engagement with the molding flange and also provide a barrier to retraction of the reverse bent end while the projections on said one strip side retain their engagement with the window periphery.

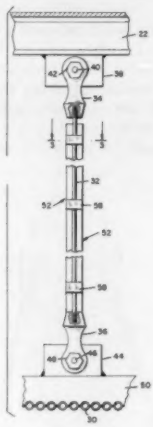
4,179,860

LATERAL STIFFENER FOR STRUT

Salvatore J. Reale, Wayne, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 24, 1978, Ser. No. 871,899
Int. Cl.[2] E04C *3/30*
U.S. Cl. 52—732 **8 Claims**

1. Apparatus for preventing buckling of a narrow member which member is subjected to a compression load comprising a rigid bar of substantially the same length as said member, one end of said rigid bar being spaced away from a respective end of said narrow member such that said rigid bar is not subjected to axial loading, said bar including first and second angularly disposed legs, each of said legs being adapted to contact said member along the length of said legs, and means for maintaining said member in contact with said bar, said means including a tie bar connected between said legs of said rigid bar and adapted to engage said member at its outer surface at a point spaced apart from the points of contact of said member with



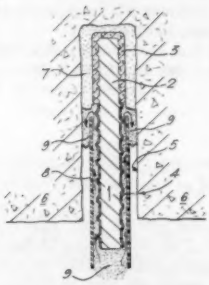
said legs, said rigid bar being adapted such that said member applies a load to said rigid bar or to said tie bar at said points of contact in a plane normal to the longitudinal axis of said member.

4,179,861

METHOD OF ANCHORING A BOREHOLE ANCHOR

John V. Brown, Aylesbury, England, assignor to Fosroc A.G., Switzerland

Filed Aug. 11, 1978, Ser. No. 932,980
Claims priority, application United Kingdom, Aug. 12, 1977, 33866/77
Int. Cl.[2] E04B *1/00*
U.S. Cl. 52—743 **7 Claims**

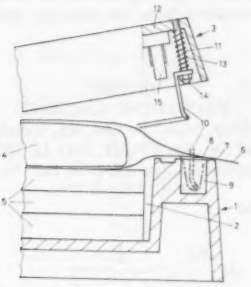


1. A method of anchoring an anchor element in a hole in a substrate, which comprise placing an end portion of the anchor element in the hole, locating about the element a sleeve dimensioned to leave an annular clearance between the element and the inner surface of the sleeve, securing the element in the hole and then supplying self-setting composition into the sleeve while withdrawing the sleeve from the hole so as to fill the annular clearance between the element and the wall of the hole with self-setting composition.

4,179,862
VACUUM PACKING MACHINE WITH BAG END RETRACTOR

Bruno Landolt, Herisau, Switzerland, assignor to Inauen Maschinen AG, Herisau, Switzerland

Filed Jun. 19, 1978, Ser. No. 916,998
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—86 **4 Claims**

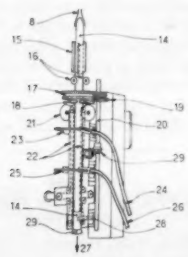


1. A vacuum packing machine having a vacuum chamber (**2**) defined by a housing (**1**), and a cover (**3**) for closing the chamber, characterized by: a recessed groove (**9**) defined in an edge (**7**) of the housing, and an elongated member (**10**) fastened to the cover (**3**) and disposed opposite the groove and generally parallel thereto when the cover is open for penetrating into the groove (**9**) when the cover is closed to automatically force end flaps (**6**) of a product bag projecting out beyond the housing edge into the groove, whereby the end flaps of the product bag are all drawn within the chamber to enable the subsequent vacuum evacuation of the bag.

4,179,863
APPARATUS FOR SECTIONING THERMOPLASTIC SHEATH AND PLACING RESULTING SLEEVES AROUND CONTAINERS

Jacques Fresnel, 15 Blvd. Lannes, Paris, France (75116)

Filed Aug. 1, 1978, Ser. No. 930,183
Claims priority, application France, Aug. 3, 1977, 77 23873; May 2, 1978, 78 12891
Int. Cl.[2] B65B *53/02, 61/00*
U.S. Cl. 53—295 **9 Claims**



1. An apparatus for automatic cutting at a programmed rate heat-shrinkable plastic sheaths into sleeves and placing the sleeves around containers, the sleeves being suitable for then being heat-shrunk around the containers, the apparatus comprising: a conveyor; a frame; means for heat-shrinking the sleeves; means on said frame for feeding a plastic sheath in flat form and for conveying it as a continuous web under predetermined tension conditions; at least one hollow mandrel; at least one vertical assembly means on said frame for cutting the sheath into sleeves and for supplying the sleeves around said hollow mandrel on which the continuous sheath is to be engaged, the assembly means including at least the following stations:

(a) means for removing pleats and fold lines on the flat sheath;

(b) means for cutting the sheath into the sleeves;

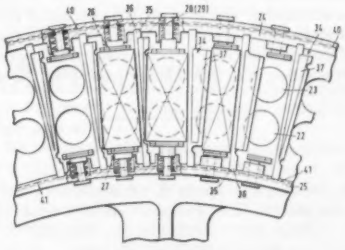
(c) staged means for automatically regulating height and rate of the cutting and at the same time for making it possible to keep said mandrel in its vertical position; and

(d) means for guiding and ejecting the sleeves downward from said mandrel, these sleeves being automatically placed around the containers to be covered which are travelling on said conveyor, said conveyor being operatively associated with said means for heat-shrinking the sleeves around the containers.

4,179,864
APPARATUS FOR SETTING AND SHAPING GLUED CIGARETTE PACKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 816,068, Jul. 15, 1977, abandoned. This application May 9, 1978, Ser. No. 904,362
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632968
Int. Cl.[2] B65B *51/14*
U.S. Cl. 53—388 **10 Claims**



1. An apparatus for setting glued flaps, tabs or the like of rectangular hinged lid cigarette packs folded from cardboard blanks and for simultaneously maintaining a predetermined configuration of the packs during the setting of the glued portions, comprising:

(a) a rotatable turret (**14**) having a plurality of forming and setting chambers (**15**) disposed around its outer periphery, each of said chambers being dimensioned to receive a single cigarette pack (**10**) and to maintain a predetermined configuration of said pack,

(b) each chamber being defined by:

(1) a floor member (**21**) lying opposite an open entry and exit end of said chamber and having apertures (**22, 23**) therein for accommodating push rods (**16**) for ejecting a pack after its glued portions have set,

(2) inner and outer side walls (**26, 27**) lying opposite each other, and

(3) two wedge-shaped, spaced, radially oriented partition walls (**34**), each rectangular pack thus being engaged over five of its six planar faces when inserted in a chamber, and

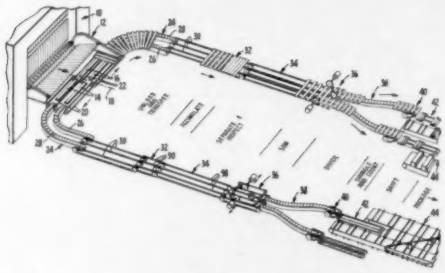
(c) the chambers being so oriented in the turret that their longitudinal axes lie parallel to the turret axis and define a cylindrical surface of revolution concentrically surrounding the turret axis.

4,179,865

PASTA NOODLE PACKAGING APPARATUS AND METHOD

Roy C. Pellaton, 2308 Virginia La., Stockton, Calif. 95204

Division of Ser. No. 827,736, Aug. 25, 1977, Pat. No. 4,147,081.
This application May 11, 1978, Ser. No. 904,928
Int. Cl.[2] B65B *35/44*
U.S. Cl. 53—435 **7 Claims**



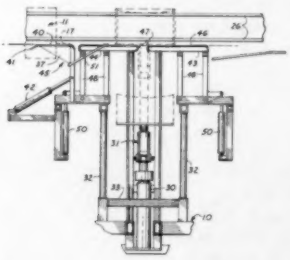
1. In combination with a stripper for stripping elongate pasta noodles from a high production pasta oven, an improved method for continuously packaging the output of the oven, said method comprising: dividing the output of the stripper into at least two components and directing said components along separate paths; conveying the respective components away from the stripper along separate paths with the elongate dimension of the noodles extending transversely of the direction of travel, said conveying step being carried out to first convey noodles away from the stripper at relatively high speed, then decrease the speed of conveyance to permit the noodles to accumulate and then increase the speed of conveyance to at least partially separate the noodles; separating the respective components into sub-components of a preselected number of noodles; and, individually packaging the sub-components.

4,179,866

CASE PACKER

Robert H. Graham, and Jerald R. McBride, both of Spokane, Wash., assignors to R. A. Pearson Company, Spokane, Wash.

Filed Apr. 3, 1978, Ser. No. 892,664
Int. Cl.[2] B65B *43/39, 5/06*
U.S. Cl. 53—468 **8 Claims**



6. A method of filling an open case having front, rear and side flaps depending downward along coplanar bottom fold lines joining the respective flaps to upright walls, comprising the following steps:

conveying the open case along a longitudinal path transverse to its front and rear flaps;

locating the case in a stationary condition at a packing station along said path;

placing a load on a thin plate structure while at a first position elevationally beneath the packing station;

moving the load and thin plate structure elevationally upward into the case at said packing station;

folding and vertically supporting the front and rear flaps of the case beneath the thin plate structure while at said packing station;

horizontally withdrawing the thin plate structure from the stationary case at the packing station by withdrawing the thin plate structure transversely to each side of the case;

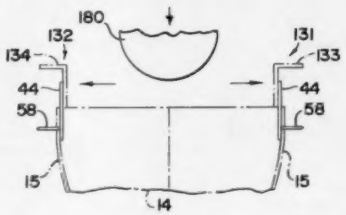
and subsequently imparting movement to the case and its contents outward from the packing station along said path.

4,179,867

PACKAGING MACHINE

William A. Bodolay, 5620 Live Oak Rd., Lakeland, Fla. 33803

Continuation of Ser. No. 470,331, May 15, 1974, abandoned.
This application Jan. 29, 1979, Ser. No. 7,297
Int. Cl.[2] B65B *9/06*
U.S. Cl. 53—568 **14 Claims**



1. A packaging machine of the type primarily designed to form containers from a folded web of material having an interior defined by opposing folded web portions, said machine comprising: frame means configured to define a flow path of travel and said web, web carrier means movably mounted on said frame and connected to said web along at least a portion of said flow path, said web carrier means at least partially disposed in supporting engagement with said web on the interior thereof, whereby fabrication of said web is performed as it travels along said flow path, said web carrier means including carrier belt means comprising at least two carrier belt elements, each of said carrier belt elements is mounted on the interior of opposite portions of said web, finger means affixed to the exterior surface of each of said carrier belt elements, said finger means of each of said carrier belt elements disposed in penetrating, supporting relation to the correspondingly positioned wall portions and outwardly from the interior of said wall portions, each of said carrier belt elements including a substantially continuous closed loop configuration, each of said carrier belt elements exposed to orient at least a portion of said closed loop configuration to travel along said flow path in substantially parallel relation to one another and in direct supporting engagement relative to said web.

4,179,868

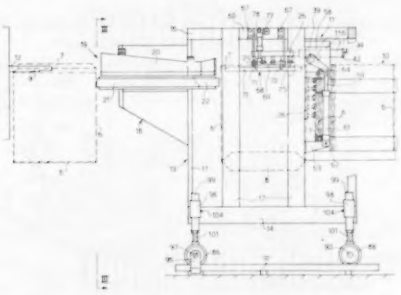
BAG FEEDING APPARATUS FOR POWDER MATERIAL PACKAGING

Angelo Raiteri, Ivrea, Italy, assignor to UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta, S.p.A., Casale Monferrato and Andrea Doria, Ivrea, both of, Italy

Filed May 12, 1978, Ser. No. 905,321
Claims priority, application Italy, Jun. 10, 1977, 68352 A/77
Int. Cl.[2] B65B *43/26*
U.S. Cl. 53—571 **9 Claims**

1. A bag feeding apparatus for powder material packaging, in which the bags to be fed are each provided with a pair of flanges folded on two opposite edges of the bag, one of said flanges being provided with a valve; said apparatus including a magazine for holding a plurality of bags to be fed with each one standing substantially vertically on an edge of the bag

deprived of flange, a valve opening device having a substantially horizontal axis and adapted to receive the valve flange of the bag lying on said axis, mounting means for mounting said valve opening device so as to locate said horizontal axis substantially in the vertical plane in which the valve flange of said bags are standing in said magazine, a plurality of vacuum cups, for picking off said bags one at a time from said magazine, a rectilinear arm carrying said vacuum cup in an inline arrangement, a shaft for pivotally mounting said arm so that the various vacuum cups of said plurality have progressively increasing distances from said shaft, means for rocking said arm in said plane from a substantially vertical position where said cups engage said valve flange to a horizontal position where said valve flange lies on said horizontal axis, and means for telescopically extending said arm parallely to the line of cups to insert the valve flange of the picked off bag into said valve opening device.



4,179,869

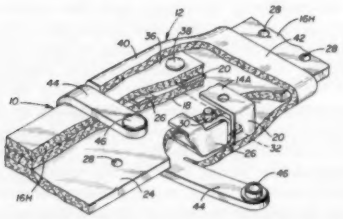
STIRRUP BUCKLE SHEATH

Thomas A. Horst, 2801 N. 111th St., Lafayette, Colo. 80026, and Charles L. Welton, Golden, Colo., assignors to Thomas A. Horst, Lafayette, Colo., a part interest

Filed May 22, 1978, Ser. No. 907,975

Int. Cl.[2] B68C *1/16*

U.S. Cl. 54—46 **6 Claims**



1. The sheath for removably encasing a two-part openable buckle on the overlapped ends of an adjustable stirrup-supporting belt which comprises: a sheet of leather shaped and closed to form a flattened tube open at both ends, said tube including a pocket intermediate its ends sized to accept the buckle in closed position and maintain same in such condition while housed therein, one of said ends being necked-down to a reduced size adapted to slidably receive the belt while remaining too small to pass over the buckle, at least one integrally-formed strap-forming flap depending from said other end of the tube, and fastener means carried by said flap cooperating therewith to define a belt-encircling collar, said collar being openable to pass over the buckle upon slidable movement of the pocket along the belt into buckle-receiving position, and said collar in closed position being effective to encircle said belt and prevent movement of the pocket therealong to a position where the buckle lies outside thereof.

4,179,870

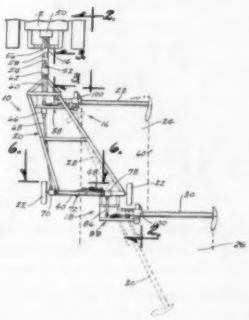
TRAILING TANDEM MOWER

Dan D. Rowse, Burwell, Nebr., assignor to Rowse Hydraulic Rakes Company, Inc., Burwell, Nebr.

Filed Jul. 13, 1977, Ser. No. 815,096

Int. Cl.[2] A01D *75/30, 55/28*

U.S. Cl. 56—6 **20 Claims**



9. A tractor pulled tandem mower having cutting bars on a mower frame offset rearwardly and laterally to provide end-to-end cutting and including steering means for moving the mower between cutting and transport positions comprising,

a generally rigid mower frame pivotally connected through a tongue to the drawbar of a tractor,

a pair of cutting bars on said frame offset rearwardly and laterally and pivotable between a horizontal cutting position and a vertical transport position,

a pair of steerable wheels connected to the rear end of said frame for pivotal steering movement about respective upright axes and

means for steering said wheels about said respective axes in unison thereby to steer said mower between cutting and transport positions with said cutting bars in said cutting position extending perpendicular to the line of travel of said tractor and mower and in said transport position extending rearwardly of said perpendicular cutting position and with said mower in said transport position and said cutting bars in their raised transport position said frame and cutting bars being positioned substantially directly behind said tractor.

4,179,871

SUSPENSION SYSTEM FOR HARVESTER SHAKER MEMBER

Gerald L. Claxton, Fresno, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed Feb. 17, 1978, Ser. No. 878,921

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—330 **10 Claims**

1. A harvesting machine comprising:

(a) a mobile inverted-U-shaped frame adapted to move longitudinally onto and straddle a plant,

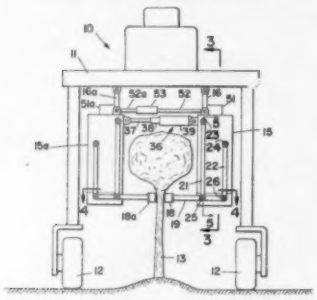
(b) a pair of opposed shaker elements disposed generally at the longitudinal centerline of said frame,

(c) an elongated and generally horizontal support member associated with each of said shaker elements, each support member extending generally transverse of said frame and having opposed ends one of which is fixed to the shaker member with which it is associated and the other of which is spaced from said shaker element outwardly from said longitudinal centerline of said frame,

(d) a pair of elongated and generally vertical suspension

members operatively associated with each of said support members, the first suspension member of each pair being longer than the second member of each pair,

(e) means pivotally connecting the upper end of the first suspension member of each pair to said frame and pivotally connecting the lower end of said first suspension member to an intermediate point on the support member with which said first suspension member is associated,



(f) means pivotally connecting the upper end of the second suspension member of each pair to said frame and pivotally connecting the lower end of said second suspension member to said other end of the support member with which said second suspension member is associated,

(g) means for reciprocating said opposed shaker elements in unison and transversely of said frame.

4,179,872

HAYMAKING MACHINE FOR CENTRAL TEDDING AND LATERAL WINDROWING

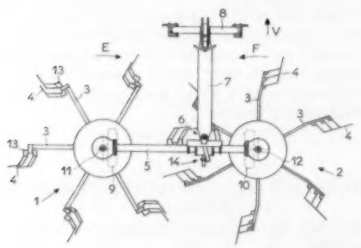
Frédéric Gerlinger, Ottersthal, France, assignor to Kuhn, S.A., Saverne, France

Filed Nov. 4, 1977, Ser. No. 848,592

Claims priority, application France, Nov. 5, 1976, 76 34064

Int. Cl.[2] A01D *81/00*

U.S. Cl. 56—366 **7 Claims**



1. In a combined haymaking machine for central tedding and lateral windrowing, having at least two rotary rake heads carrying working tools, which are driven in rotation and are interconnected by means of a support chassis upon which at least one frame is pivotally mounted which extends forward in the direction of travel of the machine and permits the coupling of the machine to a propelling vehicle; the improvement comprising means carried by the chassis automatically to cause the reversal of the direction of rotation of at least one of the rotary rake heads when the relative position between the support chassis of the rotary rake heads and said frame beam permitting coupling of the machine to a propelling vehicle is modified, thereby to transpose the machine from the central tedding position into the lateral windrowing position and vice versa.

4,179,873

HARVESTERS FOR HARVESTING BERRIES

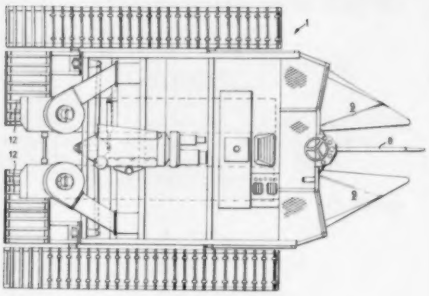
Roy Scudder, Marden, England, assignor to Edward Day, Marden, England

Filed May 16, 1977, Ser. No. 797,387

Claims priority, application United Kingdom, May 17, 1976, 20335/76

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—330 **5 Claims**



1. A harvester for bush grown crops such as currants adapted to operate in either of two entirely different discrete operating modes, a "mature bush" mode wherein each bush is split into halves and the two halves are spread apart and then shaken by applying shaking means to the inner side of each half, and a "young bush" mode wherein the bushes are shaken by applying shaking means to opposite outer sides of the bushes, said harvester comprising a carriage having a main frame, drive wheels, and a power means for driving the wheels such that the harvester is adapted to move longitudinally along a row of bushes in a bush straddling position, two laterally disposed sub-frames also straddling the bushes, two laterally disposed cylindrical shaker devices mounted for free rotation about their own axes on said respective sub-frames, said shaker devices having radially extending tines to engage the bushes, whereby, because of the relative movement between the bushes and shaker devices, said shaker devices are caused to rotate at a rate proportional to the velocity of said harvester, said shaker devices also including oscillatory means for superimposing an oscillatory increment upon the rotation of said shaker devices to thereby cause said tines to shake the bushes, bush divider means removably mounted on said main frame, and projecting downwardly and forwardly therefrom centrally and longitudinally of the harvester, for dividing the bushes into two halves and spreading the halves for operation in the "mature bush" mode, said removable mounting being applicable for detaching said divider means from said harvester for operation in the "young bush" mode, means for pivotally mounting a lower portion of each of said sub-frames on said main frame for angular movement about a longitudinally extending horizontal axis, means for selectively securing said sub-frames to said main frame in a selected one of two discrete relative angular positions associated respectively with said two discrete operating modes, in both of which positions the axes of said shaker devices diverge upwardly and outwardly from one another in a generally V shaped arrangement, in that one of which positions which is associated with the "mature bush" mode the axes of said shaker devices subtend a substantial angle with the vertical so that the laterally outer portions of the shaker devices are adapted to engage the inside portions of the spread mature bush halves, and in that one of which positions which is associated with the "young bush" mode the axes of said shaker devices are substantially vertical so that the laterally inner portions of the shaker devices are adapted to engage the laterally outer portions of the young bushes, laterally opposed crop catcher means disposed below said shaker

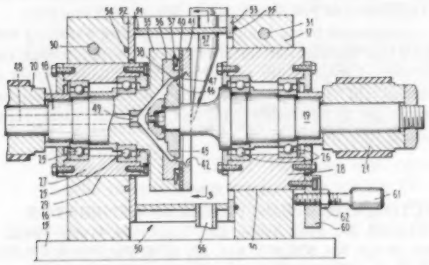
devices, and conveyor means associated with said catcher means for transporting the crop to the rear of the harvester.

4,179,874

METHOD AND APPARATUS FOR THE SPINNING OF YARN

Alan N. Jacobsen, 14 Raheen Dr., Kew, Victoria, Australia

Filed Oct. 23, 1978, Ser. No. 953,345
Claims priority, application Australia, Oct. 21, 1977, 2148/77
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 13 Claims



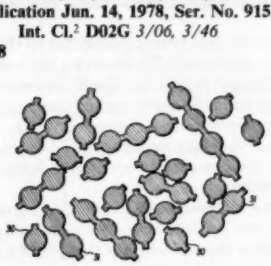
1. A method of spinning yarn comprising collecting fibres in an internal annular recess in a member rotating about the axis of the member, peeling a continuous assembly of fibres from said recess and delivering the assembly of fibres in a continuous stream to one axial end of a surface of revolution, drawing the assembly of fibres across said surface from said one axial end to an opposite axial end while simultaneously effecting movement between the assembly of fibres and said surface to cause the assembly of fibres to roll upon the surface whereby the fibres of the assembly are twisted together to form a yarn.

4,179,875

HIGH TENACITY, LOW DENIER POLY(ETHYLENE TEREPHTHALATE) FIBRILLATED TAPE YARN

John D. Gibbon, Charlotte, N.C., assignor to Fiber Industries, Inc., New York, N.Y.

Division of Ser. No. 633,758, Nov. 20, 1975, Pat. No. 4,036,003.
This application Jun. 14, 1978, Ser. No. 915,628
Int. Cl.[2] D02G *3/06, 3/46*
U.S. Cl. 57—248 5 Claims



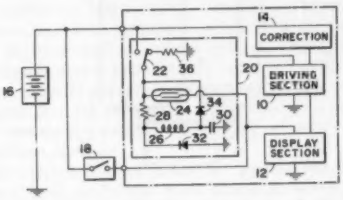
1. A low denier, high tenacity, loosely cohered, relatively uniformly fibrillated poly(ethylene terephthalate) tape yarn comprising filaments of individual unit cross-sections and filaments of multiple unit cross-sections, the cross-sections of said multiple unit cross-section filaments being a whole number multiple of said individual unit cross-section.

4,179,876

DIGITAL CLOCK FOR MOTOR VEHICLES

Masakazu Moriyama, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 12, 1977, Ser. No. 832,549
Claims priority, application Japan, Nov. 22, 1976, 51-140374; Feb. 10, 1977, 52-13645
Int. Cl.[2] G04C *17/00, 19/00, 23/00*
U.S. Cl. 58—50 R 2 Claims



1. A motor vehicle digital display clock comprising:
a clock driving section having means for generating time signals and adapted to send out desired time signals;
a digital time display section having an electric current consuming type luminescent element performing prescribed digital time display in response to said time signals from said clock driving section;
a main switch means consisting of a main switch placed between said digital time display section and a battery, and performing the display action of said digital time display section by on and off action interlocked to an ignition key switching; and
an auxiliary switch means for actuating said display action of said digital display section by switching operation of an auxiliary switch connected in parallel with said main switch when said main switch is off, said auxiliary switch means comprising a manipulation switch, a switching element which is normally opened and connected in parallel with said main switch, and a timer circuit which comprises a counter which counts to a prescribed number of said time signals of said clock driving section and which closes said switching element during a prescribed period after a switching operation of said manipulation switch thereby said digital display section performs digital time display.

4,179,877

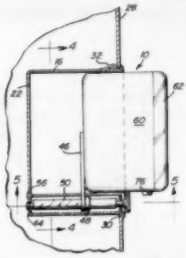
PORTABLE, VEHICLE-MOUNTED, SELF-CONTAINED ALARM CLOCK

Woodrow A. Wilson, Longview, Tex., and Herschel O. Koska, P.O. Box 5937, Longview, Tex. 75604, assignors to Herschel O. Koska, Longview, Tex., by said Woodrow A. Wilson

Filed May 26, 1977, Ser. No. 800,923
Int. Cl.[2] G04B *37/14*
U.S. Cl. 58—56 4 Claims

1. In combination, a self-contained, battery operated, portable, alarm clock, a vehicle dashboard panel having an opening therethrough capable of receiving said clock, and means securely and releasably mounting said clock in the panel opening to enable the clock to be supported in the vehicle dashboard panel and readily removed therefrom to enable it to be transported to a desired location for general utility, said clock including a casing receiving the clockworks and a time indicating means visible externally of the casing, said securing means including a mounting receptacle insertable into the panel opening and including an open portion accessible through the panel for telescopically receiving the clock casing, said clock casing and mounting receptacle including coacting recess and projecting means for releasably retaining the clock casing telescoped into the mounting receptacle, said projecting means supporting the clock on a supporting surface when removed

from said dashboard, said mounting receptacle including a peripheral flange defining the open portion with the flange projecting outwardly from the periphery of the mounting receptacle for engagement with one surface of the panel adjacent the opening therethrough, resilient retaining means mounted on said receptacle in opposed and closely spaced



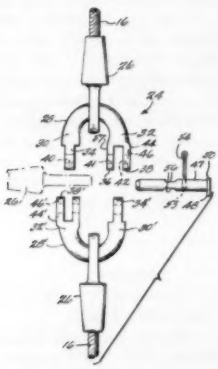
relation to the flange for engaging the opposite surface of the panel with respect to the flange for retaining the mounting receptacle in the opening with such resilient means being capable of inward movement to enable the mounting receptacle to be inserted through the opening in the panel from the side of the panel which is to be engaged by the flange.

4,179,878

IMPROVED COUPLING LINK

Rocco D. Albertini, Concordville, Pa., assignor to Baldt Incorporated, Chester, Pa.

Filed Aug. 8, 1977, Ser. No. 822,911
Int. Cl.[2] F16G *15/04*
U.S. Cl. 59—85 **2 Claims**



1. A coupling link comprising:

two similarly constructed generally U-shaped half links each having two legs with one leg terminating in a single pin receiving portion and the other leg terminating in a pair of pin receiving portions,

each of said pin receiving portions of each half link having a cylindrical bore extending therethrough with the axis thereof aligned with the axes of the other two bores,

the pair of pin receiving portions of each half link being spaced apart in an axial direction with respect to the common axis of said bores so as to provide an axially outward pin receiving portion having an axially outer surface and an axially inward pin receiving portion having an axially inner surface,

said half links being assembled with the single pin receiving portion of each half link fitted axially between the axially inward and outward pin receiving portions of the other half link and all of said bores in axial alignment,

the axially outer surface of each axially outward pin receiving portion having an annular recess therein surrounding the bore thereof,

a pin having a cylindrical shank engaged within said bores and an enlarged head on one end thereof disposed within the annular recess in the axially outward pin receiving portion of one half link, the opposite end of said pin being disposed axially inwardly of the axially outer surface of the other half link,

the cylindrical shank of said pin having a pair of parallel flat surfaces formed in the exterior periphery thereof in a position between the axially inward pin receiving portions of said half links and a transversely extending opening therethrough adjacent the axially inward surface of the axially inward pin receiving portion of said one pair, and

a cotter pin extending through said opening and disposed in operative engagement with the axially inner surface of the axially inward pin receiving portion of said one pair,

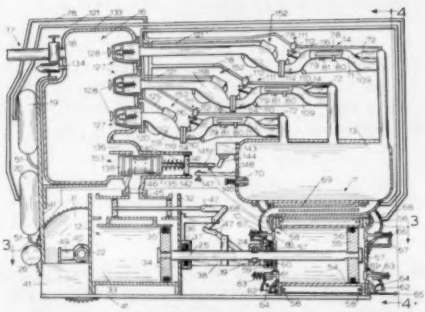
the arrangement being such that by engaging a turning tool with said parallel flat surfaces said cylindrical shank can be moved rotationally within said bores with respect to both of said half links and held into a position enabling said cotter pin to be readily removed from said opening and placed therein.

4,179,879

AUTOMATIC STEAM PRESSURE GENERATOR

Elmo Kincaid, Jr., 1160 Ashley Dr., Clarkston, Wash. 99403

Division of Ser. No. 678,987, Apr. 21, 1976, Pat. No. 4,079,588.
This application Feb. 9, 1978, Ser. No. 876,366
Int. Cl.[2] F02G *9/04*
U.S. Cl. 60—39.09 R **2 Claims**



1. An automatic steam pressure generator comprising:

(a) compression means configured for compressing ambient air,

(b) power means operatively connected to the compression means and configured for powering thereof,

(c) heat exchanger means configured for receiving the compressed air from the compression means and transferring heat therefrom to preheat injection water,

(d) an air receiving tank joined to the compression means for receiving the compressed air after it leaves the heat exchanger means,

(e) a plurality of continuous combustion burner means connected to the air receiving tank and configured to burn fuel, supplied thereto with the compressed air, producing high pressure, high temperature combustion products,

(f) water injection means joined to the burner means and configured for injecting the preheated injection water into the combustion products providing a lower temperature mixture of steam and combustion products,

(g) steam storage means connected to the water injection means for storing the mixture of steam and combustion products,

(h) each of said continuous combustion burner means including burner automatic control means, configured for activating its associated burner means and for controlling the amount of fuel and compressed air supplied to said burner means, for controlling the output of said burner means, the control means being responsive to the pressure in the air receiving tank, said burner automatic control means comprising:

(1) a cylinder open at one end to the air receiving tank, and having a port defined therein, said port opening to said burner means,

(2) a piston configured for free sliding fit within the cylinder, said piston being large enough to sealingly cover and close said port,

(3) a needle valve located within the burner means having a gear located on its terminal portion, and an orifice located at the end of the burner means in alignment with the needle valve,

(4) the needle valve being threaded into the burner means in a manner such that turning the needle valve causes it to be positionable in the burner means in a manner allowing opening and closing of the orifice,

(5) a piston rod extending from the piston and having gear teeth positioned in a manner that movement of the piston away from the air receiving tank causes the needle valve to rotate in a direction opening the orifice and movement of the piston toward the air receiving tank causes the needle valve to rotate in a direction closing the orifice,

(6) a spring normally urging the piston to a position wherein the piston covers the port and said gear teeth on the piston rod cause the needle valve to close said orifice,

(7) adjustment means engaging the spring in the cylinder in a manner allowing setting the spring tension for allowing the port and orifice to be opened at a predetermined pressure, and thereafter to be opened proportional to the pressure of the air in the air r ceiving tank, and

(8) ignition means associated with each of said burner means.

4,179,880

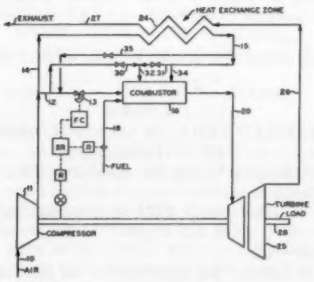
COMBUSTION PROCESS AND APPARATUS THEREFOR

Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 422,316, Dec. 6, 1973, Pat. No. 3,986,347. This application Aug. 31, 1976, Ser. No. 719,218

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.23 **20 Claims**



1. An apparatus for producing and utilizing heat energy, comprising, in combination:

(a) an air supply conduit;

(b) a combustion means for burning a fuel to produce hot combustion gases containing heat energy, said combustion means comprising a primary combustion region, a secondary combustion region located downstream from said primary combustion region and a quench or dilution region located downstream from said secondary combustion region;

(c) a fuel inlet conduit means for introducing a fuel into said primary combustion region;

(d) a primary air conduit means connected to said air supply conduit and to said combustion means for introducing a stream of air comprising primary air into said primary combustion region;

(e) a heat exchange means;

(f) a quench air and heated secondary air conduit means connected to said air supply conduit, said heat exchange means, and said combustion means for delivering a stream of air from said air supply conduit, through said heat exchange means and into said secondary combustion region and said quench or dilution region at a temperature higher than the temperature of said primary air;

(g) a heat energy utilization means for utilizing a portion of said heat energy;

(h) an effluent conduit means for passing hot combustion gases from said combustion means to said heat energy utilization means;

(i) an exhaust conduit means connecting said heat energy utilization means and said heat exchange means for passing hot combustion gases from said heat utilization means and into heat exchange relationship with the air in said quench air and heated secondary conduit to heat said air and thereby utilize an additional portion of said heat energy;

(j) a control valve disposed in said primary air conduit;

(k) control means operatively connected to said control valve in said primary air conduit and operatively connected to at least one of (1) said fuel inlet means and (2) a shaft means in said heat utilization means for controlling the rate of introduction of said primary combustion air into said combustion means in accordance with at least one of (1) the rate of introduction of said fuel into said combustion means and (2) the speed of said shaft means; and

(l) an unheated secondary air conduit means connected to said primary air conduit upstream from said control valve and to said quench air and heated secondary air conduit means for introducing air from said primary air conduit into said quench air and heated secondary air conduit to adjust the temperature of the air therein.

4,179,881

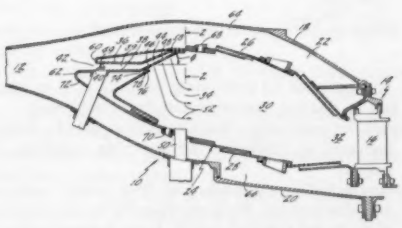
PREMIX COMBUSTOR ASSEMBLY

Joseph E. Faucher, East Hartford; Robert W. Koucky, West Hartford, and William D. Roy, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 336,578, Feb. 28, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,789

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.71 **15 Claims**



1. A combustor assembly for an axial flow gas turbine engine including a compressor forward of said assembly and a turbine rearward of said assembly, said combustor assembly comprising:

casing means forming an annular space about the engine axis;

wall means disposed within said annular space forming an annular combustion chamber, said chamber including inner and outer walls defining a combustion zone at the upstream end of said chamber, said wall means forming an outlet at the downstream end of said chamber for directing combustion products into the turbine;

duct means within said annular space forming a premixing passage having an inlet and an outlet, said premixing passage being wholly forward of said passage outlet, said inlet adapted to receive, into said premixing passage, air being discharged from the compressor; and

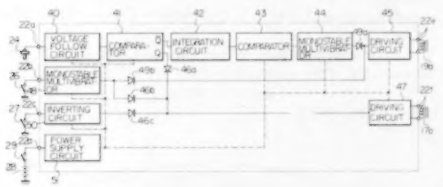
fuel supply means disposed within said premixing passage for introducing fuel into said premixing passage, the flow of air within said premixing passage atomizing the fuel within the premixing passage, said premixing passage outlet being adjacent one of said walls of said chamber and being spaced from the other of said walls and being in gas communication with said combustion zone, said wall means including baffle means disposed across said outlet of said premixing passage, for directing the fuel-air mixture from said premixing passage radially across said combustion zone toward said other wall of said chamber, said baffle means having a plurality of openings therethrough which in combination comprise thirty to fifty percent of the baffle area, said wall means including means to impart a downstream velocity to said fuel-air mixture immediately upon its being directed radially toward said other wall, said baffle means including a downstream facing surface creating stabilization regions within said combustion zone immediately adjacent said downstream facing surface of said baffle means between adjacent openings, wherein said stabilization regions are a continuous ignition source for said combustion zone during operation.

4,179,882

APPARATUS FOR CONTROLLING THE AMOUNT OF SECONDARY AIR FED INTO AN INTERNAL COMBUSTION ENGINE

Tadao Mitsuda; Minoru Iwata, both of Susono; Masatoshi Sugiura; Shigetaka Takada, both of Obu, and Yukihiro Watanabe, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisan Idustry Co., Ltd., both of Toyota, Japan

Filed Jun. 2, 1978, Ser. No. 912,007
Claims priority, application Japan, Oct. 15, 1977, 52-123002
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—276 **14 Claims**



1. An apparatus for controlling the amount of secondary air fed into an internal combustion engine, comprising:

means for generating a first electrical signal of a level which indicates an equivalent air-fuel ratio condition of said engine;

means including a secondary air flow control valve, having an initial position, for controlling the amount of secondary air to be fed into said engine, in accordance with a predetermined change in the level of an absolute pressure signal applied thereto;

a first applying means for applying an absolute pressure signal to said means for controlling the amount of secondary air, in response to a predetermined level of said first electrical signal;

means for generating a second electrical signal of a level which indicates that said air flow control valve is in the initial position, and;

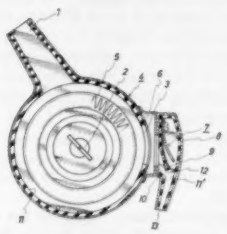
a second applying means for rapidly applying an absolute pressure signal to said means for controlling the amount of secondary air, in response to both of said first electrical signal and said second electrical signal, said second applying means being constructed to be operated independently of said first applying means.

4,179,883

REED VALVE ASSEMBLY

Takahiko Nishiyama, Kamakura, and Kenji Haga, Fujisawa, both of Japan, assignors to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,456
Claims priority, application Japan, Oct. 21, 1976, 51-142062
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—293 **1 Claim**



1. In a secondary-air exhaust gas recombustion system for internal combustion engines having noise-propagating passageways, a reed valve assembly comprising,

a reed valve case having a secondary-air supply port and a secondary-air outflow passage,

a valve seat surrounding said secondary-air supply port,

a reed secured in said reed valve case covering said valve seat,

a secondary-air supply means from said secondary air outflow passage to an exhaust gas recombustion means, and

a coating of gummous material applied to the interior surface of the noise-propagating passageways including said reed valve case,

said coating of gummous material being applied by the steps comprising,

spreading an adhesive on the interior surface, applying a large number of short fibers to the adhesive-spread surfaces, and

spraying the gummous coating material onto the fiber layer.

4,179,884

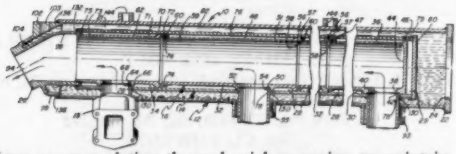
WATERCOOLED EXHAUST MANIFOLD AND METHOD OF MAKING SAME

Werner H. Koeslin, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 8, 1977, Ser. No. 822,846
Int. Cl.[2] F01N *7/06, 7/10*
U.S. Cl. 60—321 **12 Claims**

1. In an exhaust gas manifold for an internal combustion engine comprising a casing having axially spaced apart gas inlet apertures therethrough, in combination an internal exhaust conduit nested in said casing, said exhaust conduit comprising a plurality of sections, each section slidably interfitting with an adjoining section, radially disposed means between sections of the exhaust conduit and said casing to hold the sections in spaced relation from said casing and to form dead air spaces between said exhaust conduit and said casing, each

said section having an aperture aligned with one of the gas inlet apertures in said casing with said slidable interfit between said



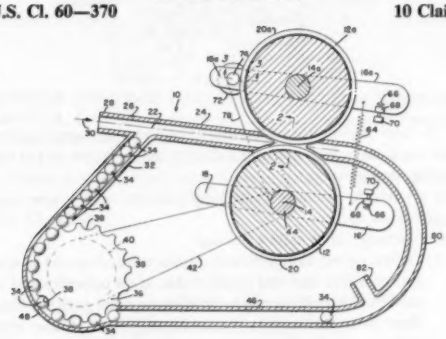
sections accommodating thermal axial expansion to maintain said alignment between the apertures in said casing and said sections.

4,179,885

TURBINE-WHEELED POWER DEVICE

Alvin S. Hopping, deceased, late of Lake Hopatcong, N.J., by Clifford A. Johnson, executor, Dover, N.J., assignors to Markley D. Fell, Hackettstown, N.J.

Filed Feb. 16, 1978, Ser. No. 878,328
Int. Cl.[2] F03G *3/00*
U.S. Cl. 60—370 **10 Claims**



1. A turbine-wheeled power device, comprising:
a plurality of journaled turbine wheels;
said turbine wheels of said plurality thereof each having a missile-impingement surface;
means disposing said surfaces in juxtaposition; and
means for addressing missiles to said surface to cause said turbine wheels to rotate.

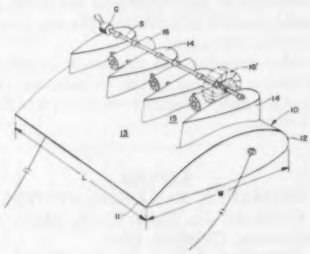
4,179,886

METHOD AND APPARATUS FOR OBTAINING USEFUL WORK FROM WAVE ENERGY

Junjiro Tsubota, 2392, Jindaiji-Machi, Chofu-shi, Tokyo 182, Japan

Filed Nov. 8, 1977, Ser. No. 849,620
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—398 **10 Claims**

1. Apparatus for obtaining useful work from or with waves, comprising: a buoyant body having an upper surface and a leading edge and a trailing edge, and constructed to float at the surface of a body of water with the upper surface of the buoyant body disposed beneath the surface of the body of water, said trailing edge being convex and curving sharply downward, said buoyant body having width and length dimensions selected such that the smaller of said dimensions is not substantially greater than approximately one half of the wave length, the movement of water particles in the waves being active upon the buoyant body in both directions of pitching motion to efficiently impart energy force to the buoyant body in both directions of pitching motion as well as in heaving motion; and mechanical means associated with the buoyant body and connected therewith to be driven by at least one of the heaving and pitching motions of the buoyant body, said mechanical means including projecting means placed on said buoyant body to define a constricted open-ended water flow channel on said body and to protrude into an orbital range of rolling motion of water in the waves, said projecting means intercepting said



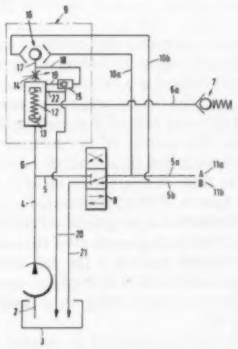
water and converting said rolling motion into substantially linear motion, and means connected to said body utilizing energy of said linear flow and of said pitching and heaving motions.

4,179,887

HYDRAULIC CONTROL WITH DELAY

Gerhard Ridder, and Wilhelm Schäfer, both of Witten-Bommern, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,067
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2724233
Int. Cl.[2] F15B *11/20*
U.S. Cl. 60—420 **7 Claims**



1. Hydraulic device for delayed pressurization of primary user of hydraulic fluid such as a clutch or brake while maintaining a reduced flow of fluid to an independently operating secondary user, comprising:
a pump for the fluid operating at an essentially constant flow rate by volume;
first conduit means connected to the pump to receive therefrom pressurized fluid;
second and third conduit means branching off the first conduit means, the primary user being connected to the second conduit means, the secondary user being connected to the third conduit means;
a control valve connected in the second conduit means for on-off control of hydraulic energization of the primary user;
a pressure controller including a differential piston in a corresponding piston chamber and being connected in the third conduit means, wherein a first piston of the differential piston operates under pressure as applied from the first

conduit means to open a pressure dependent fluid passage to the secondary user through the piston chamber;

fourth conduit means branching off the second conduit means between the control valve and the primary user and including a flow retaining throttle valve connected to a second portion of the differential piston to operate the differential piston in dependence upon the flow conditions of the throttle valve; and

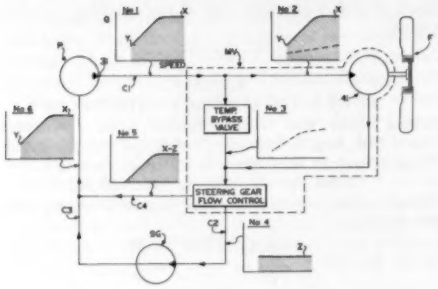
a check valve connected to the piston chamber and to a second piston, by-passing the throttle for rapid action venting of the piston chamber portion in which the second piston moves.

4,179,888

HYDRAULIC FAN DRIVE SYSTEM

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 18, 1978, Ser. No. 907,064
Int. Cl.[2] F15B *11/16*
U.S. Cl. 60—420 **12 Claims**



1. A vehicle engine accessory drive system comprising:

(a) an engine driven pump including a pumping element operable to deliver fluid at a rate generally proportional to engine speed, and fluid inlet and outlet ports, said pump having a fluid delivery rate of Y at engine idle, said pump comprising the sole source of pressurized fluid for said system and including first flow control valve means operable to limit the fluid delivery rate of said pump to X at higher engine speeds, X being substantially greater than Y;

(b) a hydraulic fan motor having fluid inlet and outlet ports, said fluid inlet port being connected to said pump outlet port, said fan motor having a fan speed at engine idle corresponding to a fluid flow rate of approximately Y, and a fan peak speed corresponding to a fluid flow rate of approximately X;

(c) bypass valve means connected in parallel with said fan motor, operable to bypass said fan motor and being responsive to the need for cooling, said bypass valve means being capable of bypassing at least a major portion of X at a first relatively lower temperature and capable of substantially preventing bypass flow at a second relatively higher temperature;

(d) second flow control valve means having its inlet in fluid communication with said outlet port of said fan motor and with said bypass flow, said second flow control valve means having primary and secondary fluid outlets and being operable to communicate a fluid flow rate of approximately Z from said fluid inlet to said primary outlet over substantially the entire range of operating engine speeds and to communicate substantially all fluid flow in excess of Z from said inlet to said secondary outlet, Z being substantially less than X;

(e) an open-center steering gear mechanism having inlet and outlet ports, said inlet port being in fluid communication with said primary outlet of said second flow control valve means;

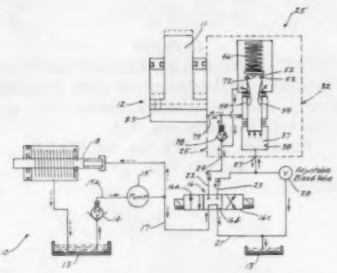
(f) said outlet port of said steering gear mechanism and said secondary outlet of said second flow control valve means being in fluid communication with said fluid inlet port of said pump.

4,179,889

CONTROL CIRCUIT FOR HYDRAULIC CYLINDER AND SHAFT ASSEMBLY

John T. Gondek, 1641 Innsbruk Cir. W., Minneapolis, Minn. 55421

Filed Feb. 22, 1978, Ser. No. 880,292
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—477 **13 Claims**



1. A control circuit for a hydraulic cylinder and shaft assembly to regulate movement of the shaft relative to one end of the cylinder, comprising:

(a) a variable pressure fluid supply means and a reservoir therefor; and

(b) metering valve means having:

(1) a first open passage means connected at one end to said one cylinder end and connectable at an opposite end to said fluid supply means to provide an open path for fluid flow from said supply means to said one cylinder end; and

(2) a second normally closed passage means connected at one end to said one cylinder end and connectable at an opposite end to said reservoir, said valve means actuable by a piloting pressure fluid from said variable fluid pressure supply means to adjustably open said normally closed passage means in response to the pressure of the fluid from said supply means; and

(c) said fluid supply means, in a first condition thereof, supplying fluid under a pressure through said first passage means to said one cylinder end to move said shaft from said one cylinder end, and in a second condition thereof, supplying pilot fluid under variable pressure to said metering valve means, to actuate said valve means and regulate fluid flow from said one cylinder end to said reservoir through said normally closed passage means to provide a precisely controlled movement of said shaft toward said one cylinder end.

4,179,890

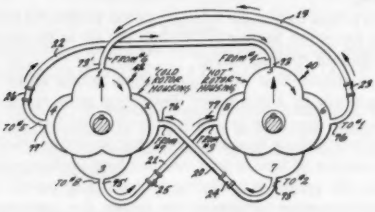
EPITROCHOIDAL STIRLING TYPE ENGINE

Goodwin Hanson, 4640 W. 118th St., #218, Hawthorne, Calif. 90205

Filed Apr. 4, 1978, Ser. No. 893,956
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—519 **9 Claims**

1. An engine having two epitrochoidal piston housings each having a plurality of lobes, a lobed rotary piston in each piston housing, a gas connection between each lobe of one piston housing and a lobe of the other piston housing for transfer of gas, shaft means for the rotary pistons, cam means associated with the shaft means and connected to the rotary pistons, the

cam means being constructed for movement in a predetermined accurate orbit whereby the rotary pistons are constrained to the same accurate orbit within the respective piston housings.

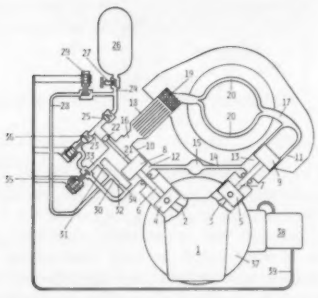


4,179,891

POWER CONTROL DEVICE FOR HOT GAS ENGINES

Karl O. R. Gronvall, Borensberg, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 12, 1978, Ser. No. 895,586
Claims priority, application Sweden, May 7, 1977, 7707767
Int. Cl.[2] F02G *1/06*
U.S. Cl. 60—521 **4 Claims**



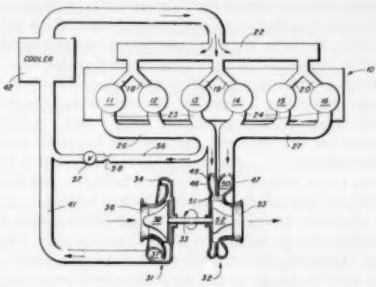
1. In a power control device for maintaining a predetermined speed of a hot gas engine irrespective of the engine load and of the type in which the power output from the engine is governed by adjusting the amount of working gas in the engine having a control system signalling as a function of speed change a set of solenoid valves for controlling the pumping of working gas in a conduit system between the engine and a reservoir, the improvement comprising, a gas compressor having a suction stroke and pumping stroke coupled to the engine and reservoir through a branched conduit including (a) a check valve connecting the compressor with the reservoir to pump gas under pressure from the compressor into the reservoir and (b) power control means operating a one-way flow check valve admitting gas to the compressor from the engine on the suction stroke under control of a solenoid for keeping it open for gas flow in both directions when the engine is running at a predetermined constant speed and permitting it to function as a one-way flow check valve so that the compressor will pump gas to said reservoir when the speed increases above said predetermined speed.

4,179,892

INTERNAL COMBUSTION ENGINE WITH EXHAUST GAS RECIRCULATION

Hans Heydrich, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 27, 1977, Ser. No. 864,811
Int. Cl.[2] F02B *37/00*
U.S. Cl. 60—605 **12 Claims**



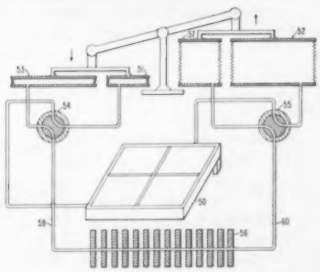
1. In an internal combustion engine including a plurality of cylinders and an intake manifold connected to supply air to said cylinders, the improvement comprising an exhaust manifold divided into first and second sections, said first section being connected to receive exhaust gases from a set of EGR pumping cylinders and said second section being connected to receive exhaust gases from the remaining set of cylinders, an EGR line connected to conduct exhaust gases from said first exhaust manifold section to said intake manifold, a turbine-compressor unit including a compressor connected to supply air to said intake manifold, and a turbine divided into first and second sections, said first turbine section being connected to receive exhaust gases from said first exhaust manifold section and said second turbine section being connected to receive exhaust gases from said second exhaust manifold section, and said first turbine section having a smaller flow area than said second turbine section and thereby increasing the pressure in said first manifold section to above the pressure in said intake manifold.

4,179,893

SOLAR ENGINE CALLED, BELLOWS SOLAR ENGINE

Louis R. O'Hare, 1041 Ponderosa #2, Fort Collins, Colo. 80521

Filed Jul. 11, 1977, Ser. No. 814,283
Int. Cl.[2] F02C *1/04*
U.S. Cl. 60—682 **5 Claims**



1. A constant pressure, variable volume thermodynamic cycle engine comprising:

(1) sealed and gas tight cooling means provided with inlet and outlet pressure tight ducting and,

(2) sealed and gas tight gas heating means provided with inlet and outlet pressure tight ducting and,

(3) gas pressure and gas force to mechanical energy conversion means in the form of sealed bellows capable of expansion and contraction by the respective filling and removal of heat pressurized gas such as air and,

(4) gas pressure distribution means providing alternately one then another set of routings of gas pressure, one of said set of routings providing a flow passage between a large expanding bellows connected to a lever on one side of a fulcrum and a smaller bellows connected to the lever arm on the opposite side of the fulcrum said gas flow passage having the gas heater means in the center of the gas flow between the large expanding bellows and the small contracting bellows, and the other routing of the first set of routings providing a gas flow communication between a smaller expanding bellows on the same side of the fulcrum as the large expanding bellows with a large contracting bellows on the opposite side of the fulcrum said flow communication thereby being routed through a cooling means in an intermediate position between said bellows, the second and alternate set of routings being provided by the alternate positioning of the gas distribution means providing for an exchange in the flow circuitry when the large expanding bellows has reached its maximum expansion, said exchange in the flow circuitry connecting said cooling means intermediate in the flow series between said expanded bellows and its opposite smaller bellows on the opposite side of the fulcrum, and the second routing of this alternate set providing a gas flow communication connecting heating means in the flow circuitry intermediate in series flow between the smaller expanded bellows (on the same side as the larger expanded bellows) and the large contracted bellows on the opposite side of the fulcrum, said alternations of the gas distribution means thereby providing separate flow channels between an expanded large bellows, a cooling means, and a small contracted bellows on the opposite side of the fulcrum on one hand and a channel between a small expanded bellows, said heating means and a large contracted bellows on the opposite side of the fulcrum and,

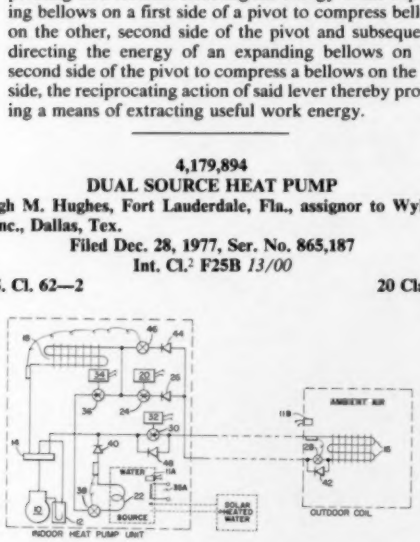
(5) mechanical energy directing means in the form of a lever pivoting on a fulcrum directing the energy of the expanding bellows on a first side of a pivot to compress bellows on the other, second side of the pivot and subsequently directing the energy of an expanding bellows on that second side of the pivot to compress a bellows on the first side, the reciprocating action of said lever thereby providing a means of extracting useful work energy.

4,179,894

DUAL SOURCE HEAT PUMP

Hugh M. Hughes, Fort Lauderdale, Fla., assignor to Wylain, Inc., Dallas, Tex.

Filed Dec. 28, 1977, Ser. No. 865,187
Int. Cl.[2] F25B *13/00*
U.S. Cl. 62—2 **20 Claims**



1. A heat pump system for either heating or cooling an enclosed area, comprising:

(a) a compressor means for compressing a refrigerant to be flowed through conduits of the system;

(b) a reversing means for selecting the direction of the refrigerant flow through the system depending upon whether the system is operating in either its heating or cooling mode;

(c) a first heat exchanger means located within the enclosed area for either heating or cooling the air to be circulated within said enclosed area;

(d) an outdoor heat exchanger means acting either as an evaporator or a condenser depending upon whether the system is operating in either its heating or cooling mode;

(e) a second indoor heat exchanger for providing an alternative source of heat to said outdoor heat exchanger means when the system is operating in its heating mode; and

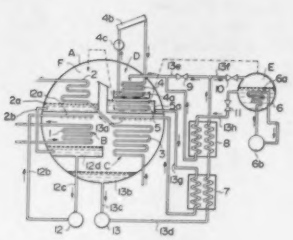
(f) a temperature discriminator means for automatically selecting either the outdoor heat exchanger means or the second indoor heat exchanger means as the operative means for exchanging heat with a source depending upon which source will provide more efficient operation for the system.

4,179,895

COOLING SYSTEM USING LOW POTENTIAL AND HIGH POTENTIAL ENERGIES

Kenji Shimokawa, Cyofu; Muneshige Nagatomo, and Yasuo Tanaka, both of Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industries, both of Tokyo, Japan

Filed Feb. 3, 1978, Ser. No. 875,007
Int. Cl.[2] F25B *27/00, 15/00, 33/00*
U.S. Cl. 62—2 **11 Claims**



1. Cooling system comprising a coolant circuit having a portion disposed in an evaporating section for feeding a coolant through the section, a cooling agent circuit for feeding a cooling agent through said evaporating section so that the cooling agent is evaporated in said evaporating section whereby the coolant is cooled due to evaporation of the cooling agent, an occluding section adapted to receive the evaporated cooling agent from said evaporating section, an occlusive agent circuit for feeding an occlusive agent through the occluding section so that the evaporated cooling agent is occluded by the occlusive agent, means for collecting the occlusive agent which has occluded the cooling agent, a first recovery section provided with means for supplying low potential energy to said first recovery section, a second recovery section provided with means for supplying high potential energy to said second recovery section, means for feeding the occlusive agent which has occluded the cooling agent alternately to said first and second recovery sections so that the cooling agent in the occlusive agent is separated from the occlusive agent under the heat energy supplied to the sections, means for transferring the cooling agent separated from the occluding agent in said second recovery section through the first recovery section to the cooling agent circuit, means for transferring the occlusive agent in said second recovery section so that the occlusive agent is brought into a heat exchanging relationship with the cooling agent from the second recovery section for further separating the cooling agent still occluded in said occluding agent, means for transferring the cooling agent separated from

the occluding agent in said first recovery section to said cooling agent circuit.

4,179,896

METHOD OF COOLING THE INTERIOR OF MOTOR VEHICLES (POWERED AT LEAST PARTLY BY HYDROGEN)

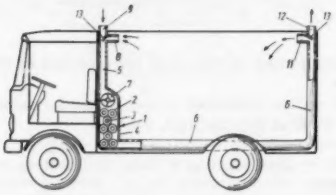
Helmut Buchner, Wendlingen, and Helmut Saeufferer, Esslingen-Liebersbronn, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,861

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631359

Int. Cl.[2] F25B *19/00;* B60H *3/04;* F25B *27/00*

U.S. Cl. 62—7 10 Claims



1. A method of cooling the interior of a motor vehicle comprising operating the engine of said motor vehicle at least in part on hydrogen liberated from at least one hydride capable of liberating hydrogen upon being heated, said hydride being a hydride of which the ΔH value is greater than 2 kcal/mole H_2 and of which the hydrogen dissociation pressure of 1 bar occurs at temperatures of from $+30°$ to $-25°$ C., supplying heat to said hydride to liberate the hydrogen and obtaining the heat so supplied to the hydride at least in part from the air circulating in the interior of the vehicle.

4,179,897

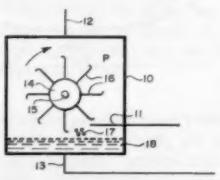
ISENTROPIC EXPANSION OF GASES VIA A PELTON WHEEL

Leonard J. Hvizdos, Emmaus; Richard E. Filippi, Allentown, and Richard E. Luybli, Hellertown, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Aug. 25, 1975, Ser. No. 607,226

Int. Cl.[2] F25J *1/00*

U.S. Cl. 62—9 6 Claims



1. A process for liquefying a first gas which comprises the steps:

compressing said first gas to a pressure above its critical pressure and cooling to a temperature below its critical temperature;

isentropically expanding the first gas through a Pelton Wheel turbine, said Pelton Wheel turbine being mounted and enclosed in a sealed housing, said expanding being conducted under conditions such that

(a) substantially all of the critical fluid is converted to a liquid at its saturation temperature or at a temperature below its saturation temperature, and

(b) a vapor environment is maintained in the housing and about the Pelton Wheel turbine by injecting a second gas into the housing, said second gas being at the saturation temperature or at a temperature above the saturation temperature of the liquefied first gas.

4,179,898

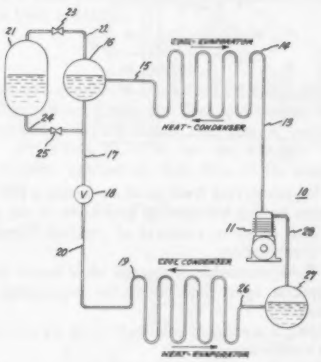
VAPOR COMPRESSION CYCLE DEVICE WITH MULTI-COMPONENT WORKING FLUID MIXTURE AND METHOD OF MODULATING ITS CAPACITY

Himanshu B. Vakil, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,339

Int. Cl.[2] F25B *00/00*

U.S. Cl. 62—114 8 Claims



1. A method of modulating the capacity of a vapor compression cycle device which comprises compressing a multi-component working fluid mixture, condensing the mixture vapor, separating the vapor and liquid, storing the liquid under high pressure, condensing selectively the separated vapor and storing the condensed liquid under high pressure, controlling separately the flow rate of the stored condensed liquids, evaporating the liquid, storing the mixture under low pressure, and controlling the flow rate of compression by the density of the vapor of the mixture under low pressure.

4,179,899

REFRIGERATING SYSTEM

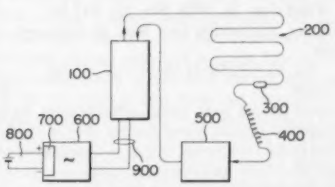
Naohiro Katayama, Tokyo, Japan, assignor to Sawafuji Electric Co. Ltd., Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 916,066

Claims priority, application Japan, Jun. 24, 1977, 52-75142; Feb. 15, 1978, 53-16069; Feb. 15, 1978, 53-16070

Int. Cl.[2] F25B *31/02;* F04B *49/10*

U.S. Cl. 62—228 13 Claims



1. A refrigerating system having an electrical vibration type compressor powered by electric energy, a condenser to which refrigerant delivered by the compressor is fed, a capillary tube provided on the downstream side of the condenser, and an evaporator provided on the downstream side of the capillary tube, wherein electric energy to be supplied to the compressor

is controlled in accordance with the ambient temperature of the refrigerating system to reduce the piston stroke of the compressor so that the compression level of the refrigerant is lowered in accordance with a drop in the ambient temperature.

4,179,900

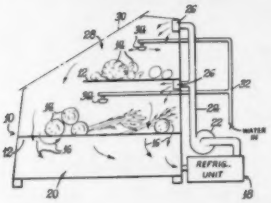
FRESH PRODUCE PRESERVATION

John E. Corrigan, 1134 Forest Ave., Evanston, Ill. 60202

Continuation-in-part of Ser. No. 704,362, Jul. 12, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,175

Int. Cl.[2] F25B *19/00*

U.S. Cl. 62—231 **4 Claims**



1. A system for preserving fresh produce within a refrigerator display means having an opening accessible to the public for inspection and selective removal of produce therefrom, comprising, in combination:

at least one fluid-permeable elongated shelf means having laterally spaced apart side edges for supporting fresh produce thereon;

means providing a stream of relatively cool air circulating about said shelf means;

a plurality of misting nozzle means centrally positioned from the lateral side edges of said shelf means and above said shelf means, said nozzle means being spaced from one another a select distance and along the length of said shelf means so that an atomized mist pattern from each nozzle means overlaps at least one adjacent atomized mist pattern;

a water supply and control means connected with said plurality of misting nozzle means for providing relatively cool water at a pressure of at least about 30 p.s.i. to said nozzle means; and

a timer means operationally connected to said control means to intermittently provide pressurized water to said nozzle means for relatively brief periods of time and to intermittently shut-off pressurized water to said nozzle means for relatively long periods of time.

4,179,901

MOTOR-DRIVEN HEAT PUMP

Ernst Fiala; Peter Hofbauer; Harald Loeck; Edgard Grundmann, all of Wolfsburg, Fed. Rep. of Germany, and Herbert Heitland, Sao Paulo, Brazil, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 20, 1978, Ser. No. 917,387

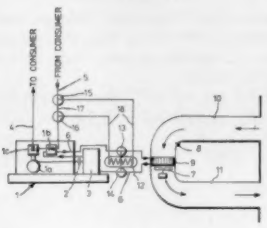
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728239

Int. Cl.[2] F25B *41/00, 27/02, 47/00*

U.S. Cl. 62—238 **5 Claims**

1. In a motor-driven heat pump arrangement including a motor; a refrigerant circuit; a compressor driven by the motor and connected in the refrigerant circuit; a condenser connected in the refrigerant circuit; an evaporator connected in the refrigerant circuit for withdrawing heat from an external, ambient medium; a heating medium circuit having a heating medium output line and a heating medium return line; a heat exchanger connected to the motor and to the heating medium circuit for transferring waste heat from the motor to the heating medium in the heating medium circuit; the heating medium circuit being connected to the condenser for transferring heat from the refrigerant to the heating medium; the condenser being arranged downstream of the heating medium return line and the heat exchanger being arranged upstream of the heating medium output line as viewed in the direction of flow of the heating medium; the improvement comprising

(a) a device for delivering evaporating heat from the heating medium to the refrigerant at a location situated upstream



of said compressor as viewed in the direction of refrigerant flow;

(b) conduit means connected to said device for passing the heating medium therethrough; and

(c) switching means for operatively connecting said conduit means to or disconnecting it from said heating medium return line.

4,179,902

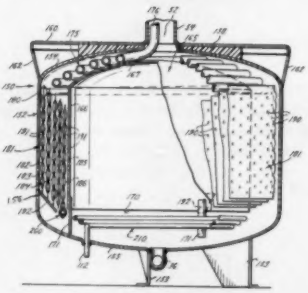
HOT WATER SYSTEM AND CONDENSING UNIT THEREFOR

Paul Mueller, and Ray A. Prine, both of Springfield, Mo., assignors to Paul Mueller Company, Springfield, Mo.

Division of Ser. No. 823,927, Aug. 12, 1977, Pat. No. 4,146,089. This application Jul. 21, 1978, Ser. No. 927,153

Int. Cl.[2] F25B *27/02;* **F28F** *1/14, 1/36*

U.S. Cl. 62—238 **12 Claims**



1. A hot water system utilizing heat of refrigerant in a refrigeration system for producing hot water at a predetermined temperature, said system comprising a refrigeration system including a water cooled condenser having a housing with a water inlet and a water outlet, a tubular coil within the housing defining a refrigerant passage therethrough, another coil within said housing, said other coil being of a sheet type having refrigerant passages formed therein which sheet is coiled to form a heat exchanged surface within said housing, said tubular coil being joined to said sheet type coil such that a refrigerant passes through both the tubular coil and sheet type coil from an inlet at one end of said combined coils to an outlet at the other end, said condenser having water passages therein between said water inlet and outlet for directing the flow of water over said combined tubular and sheet type coil, said hot water system further comprising a water storage tank having a hot water inlet and a cold water outlet, means connecting the hot water inlet of the tank to the water outlet of said condenser,

and means connecting the cold water outlet of the tank to the water inlet of said condenser.

4,179,903

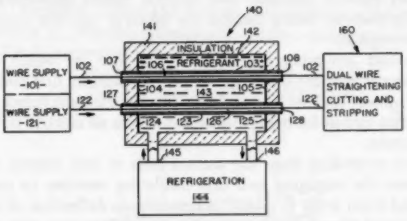
PREPARING INSULATED WIRE FOR CUTTING AND STRIPPING

Frederick H. Peabody, Jr., Newville, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Dec. 22, 1977, Ser. No. 863,278

Int. Cl.[2] F25B *25/00*

U.S. Cl. 62—322 **12 Claims**



1. Apparatus for preparing an outer insulation covering on electrically conductive wire for removal of a selectively controlled portion of the insulation from the wire and comprising in combination:

(a) a cooling chamber for cooling the outer insulation below a predetermined threshold temperature at which the responsiveness of the insulation to deformation from tensile stress is reduced;

(b) an entrance port and an exit port of said cooling chamber for the entrance and exit, respectively, of insulated wire passed through said cooling chamber; and

(c) cutting and stripping means near said exit port to which the insulated wire is fed for cutting and stripping a selectively controlled portion of the insulation from the wire, while the insulation is below said predetermined temperature, by a circumferential cut through a part of the insulation followed by the application of a tensile force whereby the insulation remaining on the wire is subjected to minimal deformation in the vicinity wherein the selectively controlled portion was separated from the remaining portion during the cutting and stripping.

4,179,904

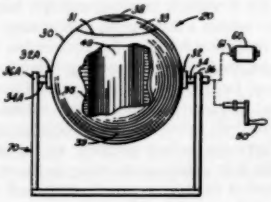
FREEZERS

Carl O. McClenny, 6154 Willer's Way, Houston, Tex. 77057

Continuation-in-part of Ser. No. 344,122, Mar. 23, 1973, abandoned. This application Apr. 5, 1977, Ser. No. 784,780

Int. Cl.[2] A23G *3/00*

U.S. Cl. 62—342 **2 Claims**



1. A freezing or cooling apparatus comprising:

a. an outer container having a sealable aperture therein;

b. first sealing means for sealing said aperture of said outer container thereby making said aperture impervious to a refrigerant which may be placed within said outer container;

c. a sealable food container having no movable elements therein, having a length or depth L, a diameter or width D, and an L/D ratio in the range of 0.5 to 2.5, and further, having at least one pair of substantially parallel walls, for receiving therein a liquid mixture, said food container being receivable through said aperture in said outer container, being completely enclosed by said outer container when said aperture of said outer container is sealed, and adapted to be in intimate contact with a refrigerant which may be placed within said outer container;

d. second sealing means for sealing said food container thereby preventing contamination or leakage of any liquid mixture therein; and,

e. means for rotating said food container in an end-over-end manner whereby the liquid within said food container is caused to slosh back and forth between said parallel walls of said food container.

4,179,905

BEARING SYSTEM IN A UNIVERSAL JOINT

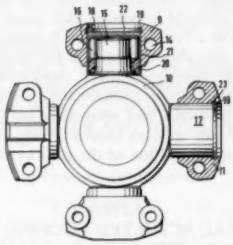
Josef Schultenkämper, Essen, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,613

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715638

Int. Cl.[2] F16D *3/26, 3/33*

U.S. Cl. 64—17 A **2 Claims**



1. A bearing system for a universal joint comprising a cross trunnion bearing pins extending outwardly from said trunnion for journaling a joint member, a journal for each of said trunnion bearing pins, at least two of said journals mounted on said joint member for receiving one pair of axially aligned said bearing pins, projecting means carried on each of said journals for cooperative engagement with said joint member for preventing radial and lateral displacement of said journal with respect to said joint member, wherein the improvement comprises an axially elongated seating bore in each of said journals for receiving therein one of said trunnion bearing pins, said seating bore extending axially through said journal having an open first end and an open second end and with said seating bore having a uniform axial length around the circumference thereof, a thin-walled bearing bushing carried in each said seating bore and extending through said first end and spaced inwardly from said second end, said bushing having a bottom wall extending transversely across said seating bore between the front and second ends of said bore and forming a closure therefor and side walls extending from said bottom wall outwardly from said first end of said bore, roller bearings positioned within said bushing and located between the inside of said side walls of said bushing and said trunnion pin received therein, said roller bearings spaced inwardly from the end of said side walls extending outwardly from said first end of said bore in an annular groove in said seating bore, a removable guard ring seated in said annular groove and in engagement with the bottom wall of said bushing for retaining said bushing in its respective seating bore, said thin walled bearing bushing having said bottom wall thereof thicker than the side walls for absorbing forces generated during rotation of said joint, and a

sealing ring located within said bushing and extending around said side walls from the end of said bushing located outwardly from said first end of said bore to said roller bearings.

4,179,906

KNITTING METHOD AND APPARATUS

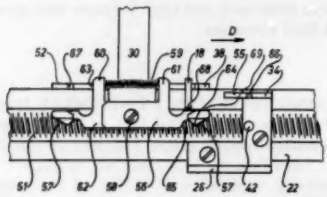
Michel Patthey, Couvet, Switzerland, assignor to Edouard Dubied & Cie. (Societe Anonyme), Couvet, Switzerland

Filed Mar. 14, 1978, Ser. No. 886,541

Claims priority, application Switzerland, Mar. 14, 1977, 3137/77

Int. Cl.[2] D04B *15/52, 15/56, 15/64*

U.S. Cl. 66—128 **9 Claims**



1. The method of knitting sections of predetermined contour and/or of a design of the Intarsia type of predetermined shape comprising the steps of moving a yarn guide member along a bank of needles in a knitting machine between a pair of carrier splicing blocks movably mounted in the machine for independent variable relative movement; selectively and independently varying the relative position and spacing of said splicing blocks in said machine, and releasably connecting said yarn guide to one of said splicing blocks during movement thereof to vary the starting position of the next knitted row.

4,179,907

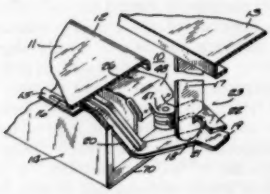
BIMETAL ACTUATED LOCKING DEVICE

Spencer C. Schantz, 5880 Anchorage Rd., Oconomowoc, Wis. 53066

Filed Mar. 15, 1978, Ser. No. 886,986

Int. Cl.[2] D06F *37/42*

U.S. Cl. 68—12 R **11 Claims**



1. A safety interlock device for use with an appliance including housing means, a motor, a component in said housing means driven by said motor, a movable door on said housing means which when closed and opened prohibits and permits access, respectively, to said component, said device comprising:

base means mounted on one of said housing means and said door,

projection means on the other of said housing means and said door,

a switch mounted on said base means and a switch operating arm mounted pivotally on said base means for moving in a first plane, said switch being caused to close when said projection means moves said arm in one direction due to closure of said door and said switch being caused to open when said projection means allows said arm to move in another direction due to opening of said door,

a latch lever mounted on said base means for pivoting in a second plane alternately into latching engagement with and disengagement from said projection means,

a first insulating member fastened to said latch lever,

a bimetal element comprised of a sequence of bimetal strips arranged adjacent and in substantial parallelism with each other and each having a first and second ends, the second ends of adjacent strips being interconnected and the first ends of alternate adjacent strips being interconnected and the first ends of a pair of strips most remote from each other being separated from adjacent strips and constituting the terminal ends of a series electric circuit through said bimetal element, said bimetal means deflecting in response to being heated by electric current passing through it,

a second insulating member on said base on which said bimetal element is fixedly supported from its first end,

said motor, said switch, and said bimetal element forming a series circuit for being connected across an electric power supply,

means extending from the second ends of said bimetal element for engaging said first insulating member to cause said latch lever to swing in response to deflection of said bimetal element so said latch lever will engage said projection means and prevent opening of said door when said bimetal element is heated by current flowing through said series circuit and will disengage said projection means and permit opening of said door when said bimetal element is cooled due to interruption of said current for a predetermined amount of time, and

insulation means covering part of said bimetal element to control the rate of cooling of said bimetal.

4,179,908

STEERING LOCK

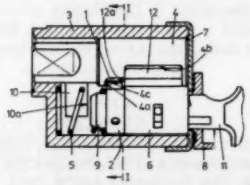
Günter Schaumburg, Radevormwald, Fed. Rep. of Germany, assignor to Neiman S.A., Courbenoie, France

Filed Jan. 5, 1978, Ser. No. 867,203

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700581

Int. Cl.[2] E05B *65/12*

U.S. Cl. 70—185 **8 Claims**



1. A lock for a vehicle steering column having a steering shaft rotatable within a fixed tube, comprising:

(a) a lock reception housing for connection to the steering wheel tube, said reception housing being formed with first and second intercommunicating spaced bores, the axes of which are disposed parallel to each other,

(b) a locking bolt within said first bore arranged to move axially between a first position and a second position where the bolt enters an aperture in the steering shaft,

(c) an abutment surface on said locking bolt disposed transversely of the axis of said bolt,

(d) a cylinder housing within said second bore axially displaceable between a first position and a second position and drivably coupled with said locking bolt,

(e) a cylinder core, having a key entry aperture, rotatable within the cylinder housing,

(f) a locking recess formed in the internal surface of the reception housing, and

(g) a locking part connected to said cylinder core projecting

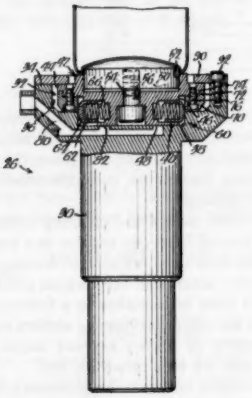
radially beyond the cylinder housing and capable of entry into said locking recess for securing the cylinder lock in its second position, wherein on axial movement of the cylinder housing into its second position rotation of the core is possible whereby the locking part projects with one portion thereof into the recess within the reception housing, the remaining portion being in engagement with the abutment surface on the locking bolt.

4,179,909

DOMER ASSEMBLY FOR IRONING MACHINE

Edward G. Maeder, Minnetonka, Minn., assignor to National Can Corporation, Chicago, Ill.

Filed Apr. 26, 1978, Ser. No. 900,270
Int. Cl.[2] B21B *45/02*; B21D *22/00*
U.S. Cl. 72—45 **10 Claims**



1. A domer assembly for use with a punch of an ironing machine to reform the end wall of an ironed container comprising a support having a recess with the base of the recess defining a support surface, a carrier element received in said recess and having a cooperating surface engaging said surface, said carrier element having a peripheral dimension which is less than the peripheral dimension of said recess, a domer element on said carrier element, means for supplying a bearing fluid between said surfaces, and biasing means between said support and carrier element normally maintaining said surfaces in a predetermined position with respect to each other and accommodating movement of said carrier element in all directions within said recess.

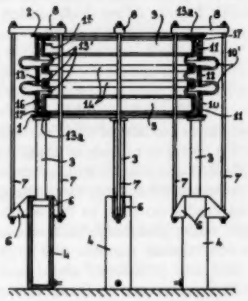
4,179,910

APPARATUS FOR MANUFACTURING DEFORMABLE EXPANSION BELLOWS FOR PIPE-WORK

Paul Mazier, Rillieux la Pape, France, assignor to S.F.Z. Soupresse Fonctionnelle Systematique, Chassieu, France

Filed Jan. 26, 1978, Ser. No. 872,494
Claims priority, application France, Apr. 2, 1977, 77 03696
Int. Cl.[2] B21D *15/06*
U.S. Cl. 72—59 **10 Claims**

1. Apparatus for the manufacture, by the technique of hydroforming, of deformable expansion bellows for pipe-work and similar assemblies, comprising means for supporting a deformable sheath from which the bellows is to be formed, means for supporting a sleeve within the sheath to define a generally annular space therebetween, means for introducing into the space a liquid under pressure to deform a portion of the sheath outwardly and to deform a portion of the sleeve inwardly, and means for applying axial thrust to the sheath and



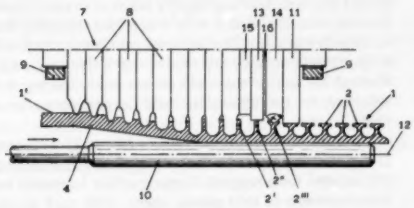
sleeve locally during application of pressure to said space by the liquid, the thrust compressing the sheath and sleeve.

4,179,911

Y AND T-FINNED TUBES AND METHODS AND APPARATUS FOR THEIR MAKING

Manfred Saier, Wullenstetten; Hans-Werner Kästner, Vöhringen, and Robert Klöckler, Tiefenbach, all of Fed. Rep. of Germany, assignors to Wieland-Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,888
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735762; Dec. 28, 1977, 2758526; Dec. 28, 1977, 2758527
Int. Cl.[2] B21H *3/00*; B21D *53/06*
U.S. Cl. 72—78 **24 Claims**



1. Apparatus for forming fins on a tube outer side, which fins run circumferentially about the tube in a continuous fashion with the outer ends of the fins approaching the outer ends of adjacent fins forming a chamber between adjacent fins, including:

support means for said tube;

rolling disc means for forming a finned tube, said rolling disc means rotating relative to said tube and including a plurality of rolling discs of successively increasing diameters rotatting about an axis of said rolling disc means;

means for notching the upper surface of the formed fins.

4,179,912

APPARATUS AND METHODS FOR FORMING PANELS HAVING SCALLOPED CROSS-SECTIONS

William Culina, R.D. # 1, Box 74-A, Champion, Pa. 15622, and Charles Klus, 204 S. 6th St., Lowber, Pa. 15697

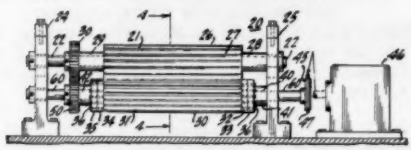
Filed Mar. 28, 1978, Ser. No. 891,150
Int. Cl.[2] B21D *13/04*
U.S. Cl. 72—196 **4 Claims**

1. A cold rolling apparatus for forming planar sheet material into panels having scalloped edge configurations, comprising:

(a) a first rotatable roller assembly manifesting a longitudinal cylindrical member having a major surface configuration

consisting of continuous arcuate projections and depressions to thus form a gear-like appearance along a major portion of the length of said cylindrical member, said first roller assembly having a first shaft section extending from one end and a second shaft section extending from said other end, said sections located relatively coaxial with the main axis of said cylindrical member, a first gear coupled to said second shaft section of said roller assembly,

(b) a second rotatable rod assembly of a length relatively equal to said major portion of said first roller assembly and consisting of a plurality of rods of equal diameter symmetrically positioned about a central reference point to form a circular cross-sectional array with the spacing between said rods selected according to the width of said projections on said roller assembly, said second rod assembly including a central shaft member of a larger diameter than said rods, said rods positioned about said shaft and centrally disposed thereabout to form said circular array, a second gear coupled to said central shaft of said rod assembly, said second rotatable rod assembly including a first and second end plate, each of a circular configuration, having a plurality of equidistant apertures located on a surface thereof with each separate rod directed at one



end into one associated aperture of said first plate and at said other end into an associated corresponding aperture in said second plate and rigidly secured in said apertures to prevent rotation of said rods when said assembly is rotated to thus form said circular cross-sectional array with said rods equally spaced about the periphery of said circle formed by said array, said plates each having a central aperture to accommodate said larger diameter central shaft,

(c) means for positioning said roller assembly with respect to said rod assembly such that the surfaces of said assemblies are located with respect to one another to enable insertion therebetween of said planar sheet, with said second gear coupled to said central shaft of said rod assembly coacting with said first gear coupled to said roller assembly and operative to drive said first gear to cause said roller assembly to rotate in an opposite direction to said rod assembly, and

(d) drive means coupled to said rod assembly for rotating the same with respect to said roller assembly to cause said sheet as emplaced and directed through said assemblies to assume a scalloped edge configuration due to said surface configurations of said first roller and said second rod assemblies.

4,179,913

METAL STRIP TENSIONING APPARATUS FOR USE IN CONTINUOUS STRIP REDUCTION COLD MILL AND METHOD

Judson W. Martt, Amsterdam, Ohio, assignor to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 737,019, Oct. 29, 1976, Pat. No. 4,086,689. This application Jan. 30, 1978, Ser. No. 873,364

Int. Cl.[2] B21B *1/28*

U.S. Cl. 72—205 **30 Claims**

1. A metal strip tensioning apparatus comprising

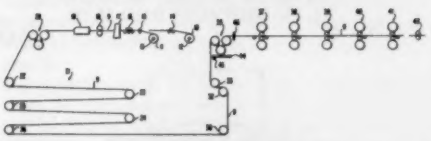
a plurality of metal strip engaging rolls for successive engagement with the metal strip, the plurality of rolls including a first roll relative to engagement with the metal strip, an intermediate roll and a final roll relative to engagement with the metal strip, the axes of rotation of the rolls being parallel and being disposed so that the metal strip engages more than 180° of the peripheral surface of the intermediate roll,

a roll supporting framework structure including journals on each side of the framework supporting the metal strip engaging rolls for rotation,

drag generator means operatively connected to at least the intermediate strip engaging roll to apply to the intermediate strip engaging roll a desired torque resistance to rotation of the strip engaging roll by the strip,

a stationary base structure for anchorage to a foundation,

vertical pivot means carried by the stationary base structure,



vertical pivot means carried by the roll supporting framework structure coacting with the vertical pivot means of the stationary base structure for pivotally mounting the roll supporting framework structure relative to the stationary base structure,

a plurality of roller means and coacting roller bearing surface means spaced from one another in a horizontal plane carried by the base structure and the framework structure,

each of the roller means and the vertical pivot means being spaced apart from one another in a horizontal plane, the roller means and the roller bearing surface means acting to form a plurality of rolling support points between the framework and the base structure, and

power means acting between the stationary base structure and the framework structure to pivot the framework structure around the pivot means.

4,179,914

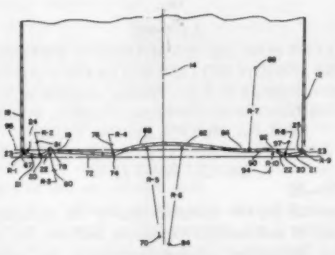
CONTAINER WITH OUTWARDLY FLEXIBLE BOTTOM END WALL HAVING INTEGRAL SUPPORT MEANS APPARATUS FOR MANUFACTURE THEREOF

Joseph F. Dulmaine, Wheatridge, and Michael E. Bagrosky, Arvada, both of Colo., assignors to Coors Container Company, Golden, Colo.

Division of Ser. No. 763,293, Jan. 27, 1977, Pat. No. 4,096,814, which is a division of Ser. No. 631,539, Nov. 13, 1975, Pat. No. 4,037,752. This application Jan. 25, 1978, Ser. No. 872,165

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—358 **5 Claims**



1. Apparatus for forming integral support structure in the bottom wall of a metallic container comprising:

first tool means for applying forming forces to one surface of the bottom wall;

a polygonally shaped cavity in said first tool means located centrally therein for receiving a central portion of the bottom wall;

at least three elongated linear edge surfaces on said first tool means defining said cavity and being engageable only with portions of the one surface of the bottom wall adjacent the central portion of the bottom wall;

second tool means for applying forming force to the opposite surface of the bottom wall; and

a protruding curved dome-like area centrally located on said second tool means for forming engagement with only the opposite surface of the central portion of the bottom wall and portions of the opposite surface of the bottom wall adjacent the central portion and being located in axial alignment with said cavity in said first tool means, said protruding curved dome-like area being dimensionally smaller than said cavity so as to be received therewithin without engagement of said dome-like area at the one surface of the bottom wall in the central portion of the bottom wall with said first tool means.

4,179,915

APPARATUS FOR THE EXTERNAL CALIBRATION (SIZING) OF TUBULAR ELEMENTS

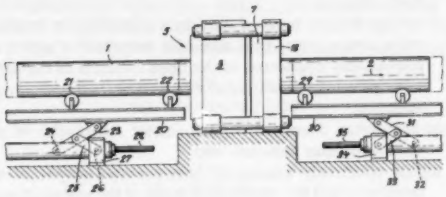
Eduard J. C. Huydts, Düsseldorf-Gerresheim, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,323

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650691

Int. Cl.² B21D *41/00*

U.S. Cl. 72—402 **7 Claims**



1. An apparatus for the external calibration of tubular workpieces, comprising:

a support;

an outer ring mounted on said support and traversed by said workpiece;

an annular piston member received in said ring and defining an annular pressurizable chamber therewith whereby said ring forms an annular cylinder for said piston member, said piston member being axially displaceable upon pressurization of said chamber, said piston member being formed along its interior with a plurality of wedging faces inclined to the axis of said workpiece, said piston member, said chamber, said cylinder, and said ring being coaxial; and

a plurality of angularly spaced members including tool segments disposed inwardly of said piston member and biased inwardly against said workpiece by engagement of said wedging faces with complementary wedging surfaces upon axial displacement of said piston member, said piston member and each of said angularly spaced members being interconnected by complementary dovetail formations coupling said segments to said piston member, each of said angularly spaced members including a respective intermediate element between each of said segments and said piston member, said intermediate elements being formed with a respective said surface complementary to and slidably engaging a respective wedging face of said piston member, one such dovetail formation connecting each of said elements with said piston member and being provided with said wedging surface and face.

4,179,916

METHOD OF AND A DEVICE FOR MEASURING THE PRESSURE AND ABRASION SENSITIVITY OF GRANULAR MATERIAL (GRAIN LOTS) DUE TO MECHANICAL STRESS

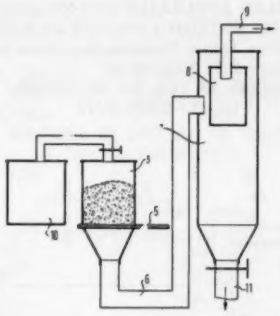
Wilhelm Konnerth, Otto-Flake-Str. 22, D-7570 Baden-Baden, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,910

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701152

Int. Cl.² G01N *3/30, 3/56*

U.S. Cl. 73—7 **28 Claims**



1. A method of measuring the pressure and abrasion sensitivity of granular material in a closed mortar comprising exposing said material to a mechanical stress; and,

comparing the variation of the weight proportions of the individual grain-size fractions of said granular material due to said stress in comparison to corresponding initial values of a representative sample of granular material, by screening analyses, including producing said mechanical stress by an abrupt exposure of the grains of said representative sample in said closed mortar to a gas-pressure wave of high kinetic energy.

4,179,917

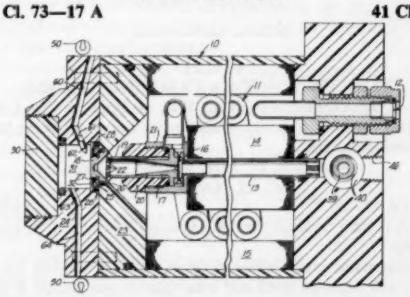
LOW PRESSURE DEW AND FROST POINT INDICATOR

Robert S. Sheldon, and Jan W. Rabek, both of Northridge, Calif., assignors to Air-Dry Corporation of America, Northridge, Calif.

Filed Dec. 16, 1977, Ser. No. 861,267

Int. Cl.² G01N *25/68*

U.S. Cl. 73—17 A **41 Claims**



1. In a low pressure dew and frost point indicator of the type in which a vortex tube directs a cold air stream against the back of a viewing mirror for observation of the initial forma-

tion of frost on the surface of the viewing mirror, the improvement comprising:

(a) means for centering and holding said viewing mirror in a fixed position with respect to said cold air output for maximum transmission of temperature change from said cold air stream to said mirror, said means comprising a tubular member extending rearwardly from said viewing mirror and fitting over the cold air output of said vortex tube, said tubular member being elongated and being formed integrally with said viewing mirror; and

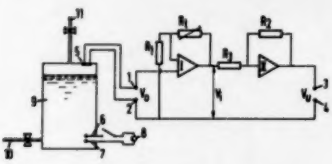
(b) a plastic adapter member extending around said cold air stream outlet, said tubular member of said viewing mirror being held between said adapter member and said cold stream output.

4,179,918

METHOD AND AN APPARATUS FOR MEASURING THE CARBON DIOXIDE CONTENT IN BEER

Johannes van Strien, Leiden, Netherlands, assignor to Heineken Technisch Beheer B.V., Netherlands

Filed Feb. 13, 1978, Ser. No. 877,090
Int. Cl.[2] G01N *33/14*
U.S. Cl. 73—19 **7 Claims**



1. The method of measuring the carbon dioxide content in beer comprising the steps of feeding a beer sample into a vessel to partially fill said vessel and create a carbon dioxide atmosphere above said beer, measuring the temperature of the beer to produce an electric signal which varies with temperature in a manner proportional to changes in a constant f with temperature wherein said constant varies substantially in accordance with the equation

$$f=-a+(b/T)$$

wherein:

f=Henry's constant

a=10.89232

b=2654.06,

measuring the pressure of said carbon dioxide atmosphere above said beer and producing an electrical signal proportional thereto and combining said signals to produce an output signal which is a direct measure of carbon dioxide content of said beer.

4,179,919

TERRAIN CONTOUR TRACKING SYSTEM

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1978, Ser. No. 943,406
Int. Cl.[2] G01B *13/08*
U.S. Cl. 73—37.5 **23 Claims**

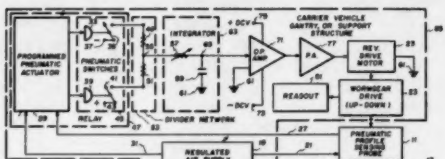
1. A terrain contour tracking system, comprising in combination:

a pneumatic probe adapted for effectively sensing the distance between itself and a surface whose profile is being tracked and measured, said pneumatic probe having a constant pressure pneumatic input, a mechanical input, a pneumatic nozzle output directed toward the aforesaid surface, and a pneumatic control output;

a pneumatic actuator having a constant air pressure input, a pneumatic control input, and a pair of pneumatic outputs, with the pneumatic input thereof connected to the pneumatic control output of the aforesaid pneumatic probe, with one of the outputs thereof capable of producing air at a predetermined pressure only when the air received at the aforesaid pneumatic control input thereof is less than a first preset pressure, with the other output thereof capable of producing air at a predetermined pressure only when the air received at the aforesaid pneumatic control input thereof is greater than a second preset pressure, and with neither output thereof capable of producing air under pressure when the pressure of the air received at the aforesaid pneumatic control input thereof falls between said first and second preset pressures;

a pair of pneumatically actuated, normally open switches connected to the outputs of said pneumatic actuator;

a negative direct current voltage connected to the movable arm of one of said pneumatically actuated, normally open switches;



a positive direct current voltage connected to the movable arm of the other of said pneumatically actuated, normally open switches;

a voltage divider network having a pair of input terminals and a center tap output, the input terminals of which are respectively connected to the open contacts of the aforesaid pair of pneumatically actuated, normally open switches;

an integrator connected to the center tap output of said voltage divider network; and

means effectively connected between the output of said integrator and the mechanical input of the aforesaid pneumatic probe for moving said pneumatic probe toward and away from the surface whose profile is being tracked and measured whenever the air supplied to the pneumatic control input of said pneumatic actuator by said pneumatic probe is less than said first preset pressure and greater than said second preset pressure, respectively.

4,179,920

CORROSION COUPON HOLDER APPARATUS

Ronald A. Schuller, and Robert I. Clarkson, both of Tulsa, Okla., assignors to Geosource, Inc., Tulsa, Okla.

Filed Feb. 23, 1978, Ser. No. 880,629
Int. Cl.[2] G01N *17/00*
U.S. Cl. 73—86 **10 Claims**

1. A pipeline corrosion coupon holder apparatus for large diameter pipelines comprising:

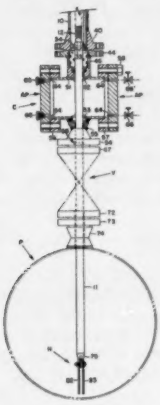
an elongated shaft housing assembly for inserting and retrieving a test coupon for a large diameter pipeline for detecting corrosion and wear of the pipeline;

said shaft housing assembly having a reciprocating shaft connecting with a coupon for inserting and retrieving the coupon and further having a first securing portion;

a coupon housing assembly having a second securing portion secured with the first securing portion of the elongated shaft housing assembly to position the elongated shaft housing assembly and coupon housing assembly on the same side of the pipeline and having a third securing portion for attaching to the large diameter pipeline;

said coupon housing assembly having a removable access

plate to allow access to a coupon for removal and replacement at the coupon housing assembly without removal of the coupons through the elongated shaft



housing assembly and without detaching the first, second or third securing portions; and

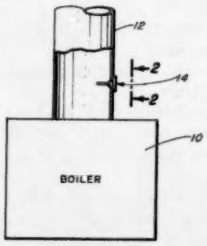
the coupon housing assembly having a guide bushing at the third securing portion to prevent jamming of the coupon during retrieving and inserting of the coupon.

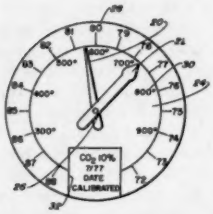
4,179,921

COMBUSTION PROCESS EFFICIENCY INDICATOR

Charles C. Cook, 18609 Greenhaven St., Covina, Calif. 91722, and Harry R. Taplin, 1540 Kirk Ave., Thousand Oaks, Calif. 91360

Filed Mar. 6, 1978, Ser. No. 883,803
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—112 **6 Claims**





3. An efficiency monitoring apparatus to continuously record the efficiency of the combustion of an external heat exchange process which discharges combusted gases into the ambient comprising:

a temperature indicator having a first pointer movable across an indicator face;

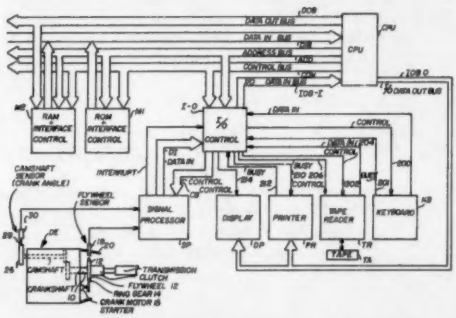
a scale located on said face, said scale including indicia to denote directly the efficiency of said combustion according to the position of said pointer, said indicia being based on the percentage of carbon dioxide in said combustion process and the type of fuel burned, there being available for selection any one of several different indicias to accommodate different types of external combustion heat exchange apparatuses, therefore, the position of said first pointer is to denote accurately the value for the efficiency of said combustion process for the ascertained temperature of the combusted gases to obtain a direct visible indication of combustion efficiency without having to resort to mathematical calculations or data manipulations.

4,179,922

DATA ACQUISITION FOR USE IN DETERMINING MALFUNCTIONS OF CYLINDERS OF AN INTERNAL COMBUSTION ENGINE

William M. Bouverie, Kings Park, and Spero G. Manas, Jamacia, both of N.Y., assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 25, 1977, Ser. No. 781,314
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 **5 Claims**



1. Apparatus for use in determining malfunctions of cylinders of an internal combustion engine, comprising:

means for providing a succession of electrical pulses respectively corresponding with successive crankshaft positions as the crankshaft of said engine rotates through at least one cycle, the time duration between successive said pulses corresponding with the time interval occurring as the crankshaft moves through the associated successive crankshaft positions, and wherein one engine cycle includes a plurality of power periods corresponding in number with the number of cylinders in the engine being tested and wherein each power period includes a plurality of said crankshaft positions;

time interval measuring means including counting means responsive to said pulses for measuring the time interval between successive said pulses such that N successive time interval measurements are made for each engine cycle having N successive crankshaft positions;

means for providing N successive time interval samples for each engine cycle wherein each said sample has a value corresponding with an associated measured time interval;

means for utilizing said interval samples for determining cylinder malfunctions of a said engine;

means for supplying clock pulses from a source of evenly time spaced clock pulses to said counting means to be counted thereby during each time period between successive said crankshaft position pulses; and

means for selectively supplying said clock pulses at a first clock rate or a second clock rate.

4,179,923

CRADLE MOUNTED DYNAMOMETER

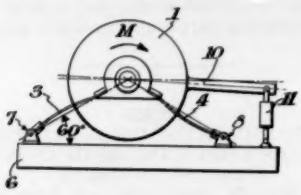
Hans-Walter Dodt, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,251

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809453

Int. Cl.[2] G01L 3/16

U.S. Cl. 73—134 5 Claims



1. A cradle mounted dynamometer which is mounted through its axis on a foundation by at least two leaf springs, the leaf springs being firmly connected with the dynamometer and having planes passing through their unstressed length which intersect the axis of the dynamometer, characterized in that pivot joints connect the ends of the leaf springs remote from the dynamometer with the foundation, and the pivot joints have axes which are disposed parallel to the axis of the dynamometer whereby rotation and oscillations are absorbed in the pivot joints.

4,179,924

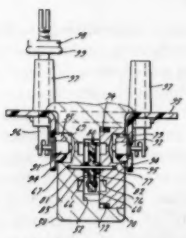
MOUNTING FOR PADDLEWHEEL PHOTOELECTRIC TRANSDUCER

Lawrence W. Tomczak, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 3, 1978, Ser. No. 892,622

Int. Cl.[2] G01F 1/06

U.S. Cl. 73—229 3 Claims



1. A photoelectric transducer mounting for a fluid flowmeter comprising a housing having a body portion, a cylindrical cavity in and opening from one side of said body portion, a cover element closing said cavity and defining a fluid chamber therein between the interior of the cavity and the cover element, fluid inlet and outlet passages in said body portion communicating with said fluid chamber, a rotor element enclosed within and rotatable by fluid entering and exhausting from said fluid chamber, said housing and cover element having a pair of aligned apertures extending therethrough in a direction parallel to the center of the chamber and located adjacent the path of rotation of said rotor element, and a photoelectric transducer assembly including photo-emitting means and photo-responsive means; said mounting including a thin, yieldable U-shaped strip of electrically insulative material conforming generally to the cross-section of and partially surrounding the periphery of said flowmeter housing for mounting on the exterior of the body portion thereof, said mounting having a pair of integrally formed, inwardly extending hollow protuberances adjacent the opposite ends of the strip for snugly receiving a different one of said photo-emitting means and photo responsive means and a number of integrally formed mounting receptacles for reception of a number of electrical terminal connector means for connection to the elements of said transducer assembly, said proturberances shaped and dimensioned relative to said apertures so as to be pressed in and sealingly received in a respective one of said aligned apertures in said housing body portion and cover element and to be readily removable therefrom without dissasembly of said cover from said housing body portion, said photo-emitting means and photo responsive means further being readily insertable and removable from said mounting without dissasembly of the mounting strip.

4,179,925

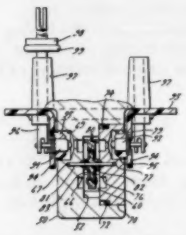
FLOWMETER ROTOR MOUNTING

Kenneth A. Graham, Beverly Hills, Mich., assignor to Chrysler Corporation, HIghland Park, Mich.

Filed Apr. 3, 1978, Ser. No. 892,460

Int. Cl.[2] G01F 1/06

U.S. Cl. 73—229 10 Claims



1. A paddle wheel flowmeter comprising in combination

a housing closed at one side thereof and having a stepped cylindrical cavity formed therein with an inner section of reduced diameter forming a fluid chamber in the housing and an outer section of enlarged diameter opening to the other side of the housing.

fluid inlet and outlet passages communicating with said fluid chamber in said housing,

a cylindrical cover closing the opening in said housing and having a shaft receiving aperture extending partly therethrough from one side of the cover facing the fluid chamber in said housing,

said housing having an aligned and similar shaft receiving aperture extending partly therethrough from the interior of the housing facing said fluid chamber therein,

a spindle shaft received at its opposite ends in said apertures in said housing and cover, and

a paddle wheel rotor member having an integrally formed, axially centrally located hub portion with a smooth internal cylindral bore therein of a diameter slightly greater than that of said spindle shaft and receiving said shaft therethrough such that a longitudinally axially extending curved upper peripheral portion of the spindle shaft is in supporting contact and surface engagement with an overlying portion of the curved wall of the bore and a lower peripheral portion is spaced from and out of contact with an underlying portion of the curved wall of the bore,

the entrance portion of each of said spindle shaft receiving apertures in said housing and cover being conically chamfered to present an enlarged countersunk entrance thereto facilitating self-centering of the spindle shaft therein and assembly of the paddle wheel and spindle shaft in the fluid chamber in the housing upon attachment of the cover thereto.

4,179,926
MULTIPLE SIGNAL THERMOPARTICULATING COATING

David C. Phillips; William M. Hickam, both of Pittsburgh, and James D. B. Smith, Turtle Creek, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 568,218, Apr. 15, 1975. This application May 12, 1977, Ser. No. 796,242

Int. Cl.[2] C09K *3/00;* G08B *21/00;* G01K *13/00, 1/00, 3/04, 3/08*

U.S. Cl. 73—339 R 20 Claims

1. A composition comprising at least two mutually non-reactive compounds which thermoparticulate at different temperatures between 60° and 200° C., at least 25° C. apart where the concentration of the compound which thermoparticulates at the lowest temperature is at least 33% less than the concentration of the compound which thermoparticulates at the next higher temperature, said composition including a solution of a resinous carrier curable at 60° C., stable at 60° C. when cured, and unreactive with any of said compounds which thermoparticulate, wherein the amount of said compounds total about 20 to about 250 phr and the amount of solvent in said solution is about 25 to about 75% (by weight based on the resinous carrier).

13. A thermoparticulating coating on a substrate comprising at least two solid layers one atop the other, each layer comprising at least one compound which thermoparticulates at a different temperature between 60° and 200° C. where the concentration of a compound which thermoparticulates at the next lower temperature than another compound is at least 33% less than the concentration of the other compound, at least one of said layers including a resinous carrier curable at 60° C. stable when cured, and unreactive with any of said compounds which thermoparticulate, wherein the amount of each of said compounds in a resinous carrier is about 20 to about 250 phr, said layers being arranged so that no layer thermoparticulates at a higher temperature than a layer which is between it and said substrate.

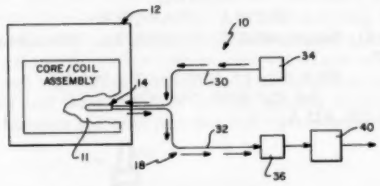
4,179,927
TEMPERATURE SENSING DEVICE

Elric W. Saaski, Richland, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 28, 1977, Ser. No. 837,451

Int. Cl.[2] G01K *11/14, 11/18*

U.S. Cl. 73—350 13 Claims



1. A device for sensing temperature changes at an object, comprising:

(a) a sensor including electrically non-conductive temperature responsive media which changes in optical density with changes in temperature, said media including the combination of gaseous NO_2 and gaseous N_2O_4 the proportion of each depending upon the temperature at said sensor, said combination having constant total mass density, said sensor being adapted for positioning adjacent said object, whereby changes in temperature at said object changes the proportions of said gases and optical density of said media and therefore the light absorption characteristic of said media, and

(b) means for detecting changes in optical density of said temperature responsive media, thereby indicating changes in temperature at said object, said detecting means including

(i) first means for directing a predetermined amount of light from a light source into said temperature responsive media, and

(ii) second means for detecting the amount of light not absorbed by said temperature responsive media, whereby a change in temperature at said object will change the amount of light detected by said second means.

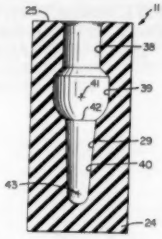
4,179,928
PUSH TYPE THERMAL DEVICE AND METHOD OF MAKING THE SAME AND A STEM SEAT THEREFOR AND METHOD OF MAKING THE SAME

Warren G. Williamson, Louisville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 22, 1978, Ser. No. 918,069

Int. Cl.[2] G01K *5/32*

U.S. Cl. 73—368.3 48 Claims



1. In a push type thermal device having a resilient stem seat provided with an opening in one end thereof and receiving an actuating stem in said opening that is adapted to reciprocate in a longitudinal direction in said opening in response to the thermal expansion and contraction of a charge of material in said device and only operatively acting on the other end of said stem seat in said longitudinal direction, the improvement wherein said stem seat has means for substantially preventing wadding of said stem seat during the stroking of said stem by the expansion of said charge of material.

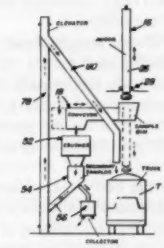
4,179,929
TRUCK SAMPLING SYSTEM

James A. Redding, 615 Washington Rd., Pittsburgh, Pa. 15228

Filed Jul. 21, 1978, Ser. No. 926,742

Int. Cl.[2] G01N *1/08*

U.S. Cl. 73—423 R 12 Claims



1. A system for sampling a load of bulk material disposed on a stationary carrier, comprising, in combination:

(A) a supporting frame;

(B) core removal means vertically, reciprocally mounted on

the frame for gathering samples from a bulk material disposed below the core removal means; and

(C) processing means mounted on the frame for receiving samples from the core removal means and processing the samples for analysis of the quality of the material constituting the load;

wherein the core removal means includes, in combination:

(1) sample tube means mounted on the frame for reciprocating movement along a substantially vertical path of travel toward and away from a load of bulk material to be sampled; and

(2) conveyor means mounted on the frame for reciprocating movement in a substantially horizontal plane between a position extending from beneath the sample tube to the processing means, and a position to one side of the vertical path of travel of the sample tube so as to permit the sample tube to travel downwardly toward the load being sampled.

4,179,930

GRAIN PROBE

Lynn E. Chrisp, R.R.#1, Juniata, Nebr. 68955

Filed Dec. 5, 1978, Ser. No. 966,554

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—425.2 **5 Claims**

1. A grain sampling probe comprising:

an elongated, hollow body provided with an internal chamber;

means at the normally lower end of said body for facilitating penetration of the body in a longitudinal direction into a supply of grain to be sampled;

a lateral port in said body communicating said chamber with the exterior of the body;

a valve cover shiftable longitudinally along said body for opening and closing said port;

a first stop on the body in the path of travel of said valve cover for preventing said shifting of the valve cover in one direction beyond a closing position wherein the valve cover closes said port as the body is inserted into the grain supply; and

a second stop on the body spaced longitudinally from said first stop and disposed in the path of travel of said valve cover for preventing said shifting of the valve cover in the opposite direction beyond an opening position wherein the valve cover opens said port as the body is withdrawn from the grain supply, thereby permitting a sample of grain to enter said port and collect in said chamber,

said body comprising a tube,

said penetration facilitating means comprising a tapered nose closing the normally lower end of said tube and provided with a radially outwardly projecting shoulder defining said second stop.

4,179,931

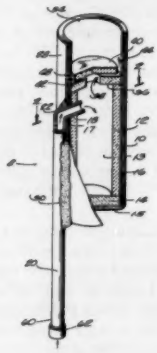
PNEUMATIC METAL SAMPLER

Kazuo Moriya, Tokyo, Japan, assignor to Richard A. Falk, Hartland, Wis.

Filed Sep. 15, 1978, Ser. No. 942,511

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—425.6 **5 Claims**



1. A molten metal sampler having cartridge wall means including a side wall and end walls defining a sample cavity for forming a sample for analysis, said side wall means having an aperture defining a side entry fill port for filling said cavity, said aperture being located intermediate the end walls, a fill tube having one end communicating with said fill port in said sampler and the other end remote from said fill port for immersion in a molten metal melt, vent means for said cavity, and pressure reducing apparatus in communication with said cavity through said vent means for reducing the pressure in said cavity and said fill tube to withdraw molten metal into said fill tube where it flows by gravity to fill the sample cavity and wherein said fill tube is secured to said housing by refractory cement.

4,179,932

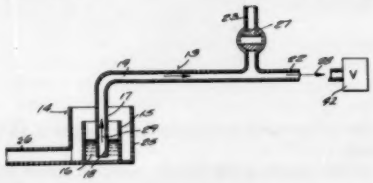
SUPPLY APPARATUS

Hubert O. Ranger, 1535 E. Goodrich La., Milwaukee, Wis. 53217

Filed May 12, 1978, Ser. No. 905,317

Int. Cl.[2] B08B *5/00*; G01N *1/14*

U.S. Cl. 73—423 A **1 Claim**



1. A supply device for liquid analysis including,

a probe,

a liquid container,

said probe and said liquid container being relatively movable whereby said probe may be selectively disposed in said liquid container,

a takeoff conduit connected to the probe for conveying liquid from the liquid container,

a rinse fluid reservoir,

rinse fluid in said reservoir,

a movable valve in the takeoff conduit,

a secondary conduit connecting the reservoir and the valve,

vacuum means for drawing liquid from said liquid container through said probe and takeoff conduit when said valve is in a first position,

said rinse fluid flowing from said reservoir through said secondary conduit into the takeoff conduit when said valve is in a second position,

a portion of said rinse fluid flowing downstream from said valve toward said vacuum means and a portion of said rinse fluid flowing upstream from said valve toward and through said probe and into said liquid container when said valve is in said second position.

4,179,933

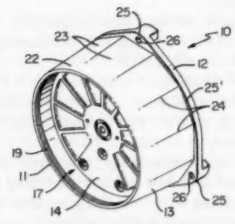
GAGE CONSTRUCTION AND CASING BODY THEREFOR

Larry V. Price, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 27, 1978, Ser. No. 881,353

Int. Cl.[2] G01D *11/24*

U.S. Cl. 73—431 **12 Claims**



1. In a gage construction having a substantially hollow casing body for containing gage components therein and being provided with a circular front face interconnected to a rear mounting flange by an annular side wall means disposed therebetween, said side wall means generally increasing radially outwardly from said front wall to said rear mounting flange, the improvement wherein said side wall means has a generally polygonal exterior surface portion adjacent said rear mounting flange and a generally frusto-conical exterior surface portion adjacent said front face, said surface portions blending together between said front face and said rear mounting flange.

4,179,934

METHOD AND APPARATUS FOR MONITORING PARTICLE SIZES

Ladislav Svarovsky, Bradford, England, assignor to University of Bradford, Bradford, England

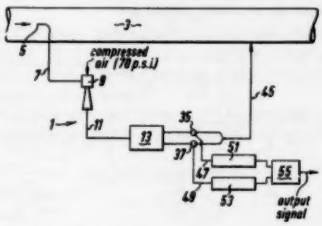
Filed May 15, 1978, Ser. No. 905,944

Claims priority, application United Kingdom, Jul. 6, 1977, 29950/77

Int. Cl.[2] G01N *15/02*

U.S. Cl. 73—432 PS **11 Claims**

1. Apparatus for monitoring particles entrained in a gas stream, said particles having an electrical noise associated therewith, the characteristic of said electrical noise being related to the size of said particle, comprising means for separating at least a portion of the particles in said gas stream into at least two fractions of relatively different average particles sizes



and means for comparing the electrical noise associated with the two or more fractions.

4,179,935

SPEEDOMETER FOR MOUNTING ON A CYCLE

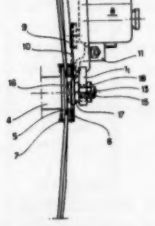
Roger H. M. Huret, Nanterre, France, assignor to Etablissements Huret & Ses Fils, Nanterre, France

Filed Aug. 21, 1978, Ser. No. 935,593

Claims priority, application France, May 23, 1978, 78 15335

Int. Cl.[2] G01P *1/02*

U.S. Cl. 73—493 **8 Claims**



1. In combination a bicycle speedometer, a bicycle wheel for mounting on the fork of a bicycle and said bicycle wheel having an axle, axle securing means for securing said axle to said fork and means for operatively securing said speedometer to said axle for activation of said speedometer on rotation of said wheel, said means for operatively securing being independent of said axle securing means whereby said speedometer remains in operative relation to said wheel when said axle is disengaged from said fork.

4,179,936

ACOUSTIC IMAGE RECORDERS

Simon D. Bennett, and Eric A. Ash, both of London, England, assignors to National Research Development Corporation, London, England

Filed May 18, 1978, Ser. No. 907,320

Claims priority, application United Kingdom, May 17, 1977, 20712/77

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—606 **12 Claims**

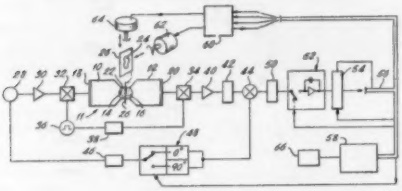
10. A method for sensing change in an object comprising:

irradiating the object with a focused beam of acoustic radiation excited by a first alternating electric signal;

receiving a beam of acoustic radiation modulated in phase and amplitude by the object in the vicinity of the focus and for deriving a second alternating electric signal therefrom;

providing a reference electric signal derived from the first alternating electric signal and at a known phase;

mixing coherently the second signal and the reference signal to derive an in-phase signal; and



mixing the second signal and the reference signal altered in phase by between 80° and 100° to derive a quadrature signal.

4,179,937

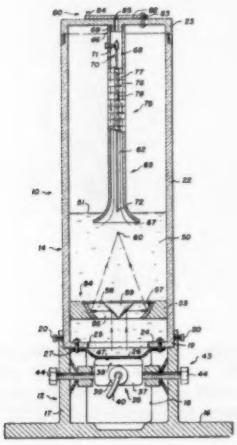
SOUND MEASURING DEVICE

John N. Koblanski, Burnaby, Canada, assignor to Ocean Ecology Ltd., Edmonton, Canada

Filed Jun. 2, 1978, Ser. No. 912,112

Int. Cl.[2] G01H *3/10*

U.S. Cl. 73—646 **10 Claims**



1. Apparatus for measuring the intensity of sound comprising;

a container having a peripheral wall and a bottom closure transparent to sound energy,

a body of liquid within the container, said body of liquid being partly supported by the bottom closure and having a top surface disposed intermediate the height of the peripheral wall,

a tube supported within the container above the body of liquid and having an open lower end disposed near the top surface,

mounting means for supporting a sound-generating transducer below the bottom closure and in vibrational contact therewith whereby vibrations generated by said transducer travel upwardly through the body of liquid as sound waves,

focusing means for concentrating the sound waves at a focal region located a predetermined distance below the top surface whereby to project a column of said liquid upwardly into the tube to a height proportionate to the output of the transducer, and

measuring means for indicating the height of the liquid column within the tube.

4,179,938

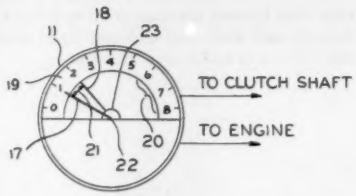
DUAL INDICATING TACHOMETER APPARATUS

Jack B. Schramm, 5218 Mulford, Skokie, Ill. 60076

Filed Apr. 6, 1978, Ser. No. 893,942

Int. Cl.[2] G01P *3/04*

U.S. Cl. 73—510 **3 Claims**



1. A dual-indicating tachometer apparatus for use with a vehicle to differentiate between the rotational speeds of an engine and clutch shaft of said vehicle, said apparatus comprising:

first tachometer sensing means operably attached to the engine of said vehicle for monitoring the rotational speed of said engine;

second tachometer sensing means operably attached to the clutch shaft of said vehicle for monitoring the rotational speed of said clutch shaft;

sensing joinder means at which both said first and second sensing means terminate for co-ordination between said sensing means as well as comparison of said respective rotating values;

said joinder means comprising concentric coupling device wherein one of said first or second sensing means is operably attached to an inner coupling portion while said other of said first or second sensing means is operably attached to an outer coupling portion;

said outer coupling portion freely rotatable about said inner coupling portion to permit the independent display of said respective rotational speeds through said rotation speed display means;

indicating means operably connected to said sensing joinder means for clearly and accurately displaying to a user of said vehicle the differences between the rotational speeds of said engine and clutch shaft thereby assisting and informing said user as to the efficiency of torque transmission from said engine to said clutch shaft for transmission shifting therebetween;

rotation speed display means for displaying the actual rotational speeds of both said engine and clutch shaft respectively thereby apprising said user of the respective speeds as well as the difference between speeds;

said rotation speed display means comprising a first indicator pointer means attached to said outer coupling portion and a second indicator pointer means attached to said inner coupling portion of said joinder means;

each of said first and second indicator pointer means being enclosed with said joinder means in an apparatus housing;

each of said first and second indicator pointer means positioned in front of a common calibrated dial, to represent the speeds of said engine and clutch shaft respectively,

said indicating means for displaying said differences in speeds comprising an exposed portion of said dial when said first and second indicator pointers are not in alignment and thus when the rotational speeds of said engine and clutch shaft speeds are unequal;

said indicating means further comprising spring loaded flag means operably interposed between said first and second indicator pointers,

said flag means being increasingly exposed to said user as the difference between said engine and clutch shaft speeds increase to in turn increase the distance between said first and second pointers, and

said flag means alternatively capable of being springedly withdrawn as said first and second pointers approach alignment as said engine and clutch shaft rotation speeds approach one-another.

4,179,939

DIESEL FUEL PIPE TRANSDUCER

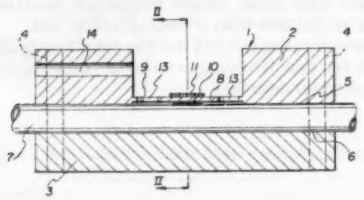
Ronald Price, Hazeldean, Canada, assignor to Goodwood Data Systems Ltd., Ontario, Canada

Filed Aug. 25, 1978, Ser. No. 936,800

Claims priority, application Canada, Nov. 10, 1977, 290636

Int. Cl.² G01L *7/02*

U.S. Cl. 73—730 **7 Claims**



1. A transducer for monitoring dynamic variations in the diameter of a fuel injector pipe of a diesel engine, said transducer comprising: an elongate transducer body adapted to envelope a portion of said pipe and including an elongate passageway therein for placement of the pipe therethrough, means at least promixate either end of said body for securely connecting the body to the pipe, said body further including a thin and planar transverse bridge section located intermediate the ends of said body and wherein said bridge lies in a plane parallel to the longitudinal axis of said passageway, and a strain detecting element mounted on the exterior surface of said bridge.

4,179,940

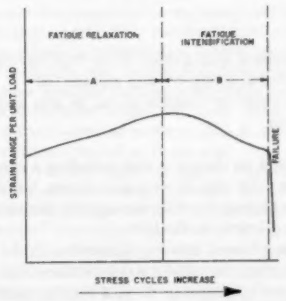
STRUCTURAL FAILURE DETECTION METHOD

Donald H. Oertle, and Marvin L. Peterson, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Oct. 2, 1978, Ser. No. 947,809

Int. Cl.² G01N *3/32*

U.S. Cl. 73—808 **9 Claims**



1. A method for monitoring imminent fatigue crack failure of metallic structural members comprising sensing strain on said structural member and monitoring said strain for fatigue relaxation and subsequent fatigue intensification, said crack initiation being of high probability when fatique intensification as determined by the measured strain range per unit load returns to near or below beginning measured strain values.

4,179,941

METHOD OF AND APPARATUS FOR MEASURING THE FLEXURAL STIFFNESS OF A SHEET LIKE SAMPLE

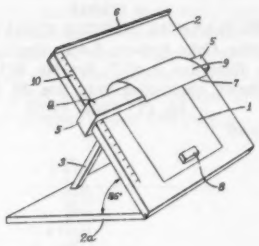
Alfred Walter, Schlieren, Switzerland, assignor to Alfred Walter AG, Schlieren, Switzerland

Filed Aug. 16, 1978, Ser. No. 933,997

Claims priority, application Switzerland, Aug. 22, 1977, 10285/77

Int. Cl.² G01N *3/20*

U.S. Cl. 73—854 **10 Claims**



1. A method of measuring the flexural stiffness of a sheet like sample comprising placing the sample on an oblique surface with the upper edge being above a horizontal clamping line, pivoting the upper portion of the sample about the vertical so that the upper portion of the sample freely sags outward about the clamping line, and reducing the free clamping length measured between the top edge of the sample and the clamping line until the sample independently pivots back into the oblique surface, whereby the residual clamping length measured at the back pivoting is a measurement of the flexural stiffness of the sample.

4,179,942

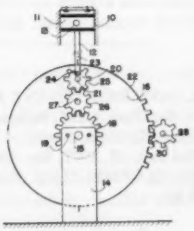
VARIABLE RATIO CRANK ASSEMBLY

Leslie C. Matthews, 203-2033-11th Ave.SW., Calgary, Canada (T3C 0P2)

Filed Jan. 9, 1978, Ser. No. 867,874

Int. Cl.² F16H *21/18*

U.S. Cl. 74—43 **11 Claims**



1. In an internal combustion engine which includes supporting structure, at least one piston reciprocal within a cylinder and a connecting rod operatively connected by one end thereof to said piston and extending from said cylinder; the improvement comprising in combination a relatively large drive wheel, means to journal said drive wheel for rotation, means operatively connecting said drive wheel to said connecting rod, said means including a stationary gear concentric with said drive wheel and having a diameter less than the drive wheel, a relatively small connecting rod gear, means journal-

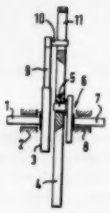
ling said connecting rod gear for rotation upon one face of said drive wheel in a position between the axis of said drive wheel and the perimeter thereof, said connecting rod being pivotally secured by the other end thereof to one side of said connecting rod gear in a position between the axis of said connecting rod gear and the perimeter thereof, and means operatively connecting said connecting rod gear with said stationary gear and means whereby the pivotal securement of said connecting rod to said connecting rod gear is nearest to the perimeter of the said drive wheel at top dead center and bottom dead center of said piston and nearest to the axis of said drive wheel at a position 90° of rotation from top dead center and bottom dead center.

4,179,943

MECHANICAL TORQUE CONVERTER

Vittorio Gamba, Calle Amboto, 5-4°B Algorta,, Vizcaya, Spain

Filed Jun. 3, 1977, Ser. No. 803,165
Claims priority, application Italy, Sep. 30, 1976, 27833 A/76
Int. Cl.[2] F16H *33/02*
U.S. Cl. 74—64 **19 Claims**



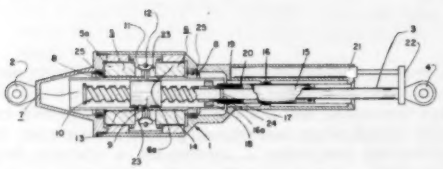
1. A mechanical torque converter of kinetic-inertial operation, comprising:
an input shaft to which a torque is applied;
at least one idly rotating mass; means driven by the input shaft and adapted to impress on said mass a periodic rotary motion in which the speed variations in the first quarter of the period of rotation are less than those in the last quarter, while the speed variations in the second quarter of the period of rotation are greater than those in the third;
means to which said mass transmits the reactions consequent on its motion; and
an output shaft on which the last-named means generate a torque, the intensity of which varies in inverse proportion to the instantaneous angular acceleration of the mass, and to the speed of rotation of said output shaft.

4,179,944

FAIL SAFE REDUNDANT ACTUATOR

Gary E. Conner, San Jose, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 27, 1977, Ser. No. 810,149
Int. Cl.[2] F16H *27/02, 29/02, 1/18*
U.S. Cl. 74—89.15 **2 Claims**



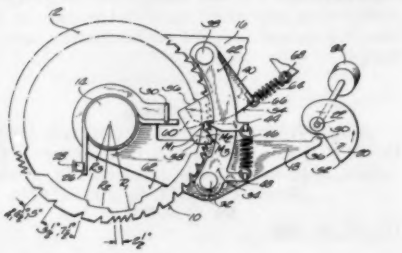
1. A fail-safe actuator comprising:
(a) an output shaft;
(b) a guide shaft receiving said output shaft;
(c) first delatchable coupling means connecting said output shaft and said guide shaft;
(d) power screw means for driving said guide shaft in a longitudinal direction, said power screw means comprising screw means comprising screw and nut components;
(e) rotor shaft means receiving said nut component;
(f) connecting means connecting said nut component to said rotor shaft means in rotationally fixed, translationally free relationship therewith;
(g) second delatchable coupling means preventing translational motion of said ball nut means within said rotor shaft;
(h) first and second reversable drive means for causing rotation of said rotor shaft, said first drive means being adapted to rotate said rotor means in a clockwise direction in normal operation and said second drive means being adapted to rotate said rotor shaft in a counter-clockwise direction in normal operation;
(i) means for delatching said second delatchable coupling means when either of said motors are operated in the reverse direction from normal operation; and
(j) means directing said ball nut into delatching engagement with said first delatching means after said second delatching means is delatched.

4,179,945

VARIABLE STEP SIZE IMPULSE DRIVE

George Obermann, Niles, Ill., assignor to The Singer Company, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,321
Int. Cl.[2] F16H *29/00*
U.S. Cl. 74—122 **10 Claims**



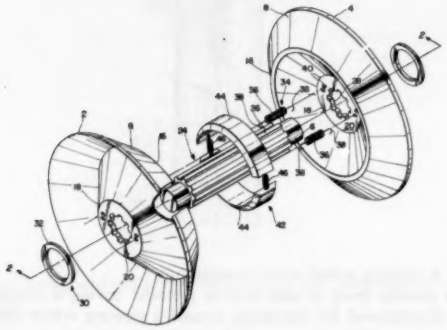
1. The combination with a timer of the type having a switching device rotated in a step-by-step manner, of
a ratchet mounted for rotation about its axis and including ratchet teeth,
a pivot,
a lever mounted on the pivot and including a cam follower,
a rotatable impulse cam having a slow-rise, fast-drop face,
spring means biasing the follower against the cam face,
a drive pawl pivoted on the lever,
said pawl being biased into engagement with the ratchet,
said cam actuating the pawl a fixed distance equivalent to a fixed angular relationship to said ratchet each time said follower drops down the fast-drop face,
said ratchet teeth having various angular spacings up to said fixed angular relationship,
means sensing the angular size of the step next to be taken and limiting engagement of the pawl with the ratchet accordingly.

4,179,946

VARIABLE RATIO DRIVE SYSTEM INCLUDING A COMPACT VARIABLE DIAMETER PULLEY

Steven J. Kanstoroom, 10516 Cascade Pl., Silver Spring, Md. 20902

Filed Dec. 19, 1977, Ser. No. 861,971
Int. Cl.[2] F16H *55/52, 55/56*
U.S. Cl. 74—230.17 E 8 Claims



1. A speed responsive, variable ratio transmission, comprising

A. a V-belt;

B. a first variable diameter pulley for engagement with said V-belt, said first variable diameter pulley including:

(1) a first rotatably supported hub,

(2) first and second identically shaped pulley members, each said first and second pulley member including an outer frusto-conical surface, an inner frusto-conical surface spaced radially inwardly within the axial limits of said outer frusto-conical surface, a radial flange extending from the inner radial extremity of said inner frusto-conical surface toward said first central hub, and first connection means for connecting the inner radial extremity of said radial flange to said first central hub to prevent relative rotational movement therebetween and to permit axial movement on said first central hub to vary the effective diameter of said first variable diameter pulley by causing opposite sides of said V-belt to engage, respectively, said outer frusto-conical surfaces at a radial distance from the rotational axis of said first central hub dependent upon the axial spacing between said outer frusto-conical surfaces,

(3) first bias means connected with said radial flanges of said first and second pulley members for biasing said pulley members together into engagement with opposite sides of said V-belt, and

(4) second bias means for overcoming said first bias means to displace said pulley members apart axially by a distance which is proportional to the rotational speed of said members, said second bias means includes an inertial mass mounted radially inwardly of said outer frusto-conical surfaces within the axial space between said inner frusto-conical surfaces and in contact with said inner frusto-conical surfaces; and

C. a second variable diameter pulley rotatably linked with said first variable diameter pulley by said V-belt, said second variable diameter pulley including:

(1) a second rotatably supported central hub,

(2) a pair of identically shaped tension operated pulley members, each said tension operated pulley member including an outer frusto-conical surface, an inner frusto-conical surface spaced radially inwardly within the axial limits of said outer frusto-conical surface, a radial flange extending from the inner radial extremity of said inner frusto-conical surface toward said second central hub, and second connection means for connecting the inner radial extremity of said flange to said second central hub to prevent relative rotational movement therebetween and to permit axial movement on said second central hub to vary the effective diameter of said second variable diameter pulley by causing opposite sides of said V-belt to engage, respectively, said outer frusto-conical surfaces at a radial distance from the rotational axis of said second central hub dependent upon the axial spacing between said outer frusto-conical surfaces, each said tension operated pulley member being identical in shape with each of said first and second pulley members, and

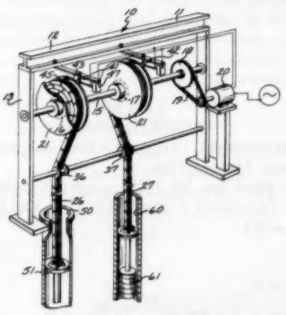
(3) tensioning means connected with the radial flanges of said tension operated pulley members for biasing said tension operated pulley members together to cause the outer frusto-conical surfaces of said pair of tension operated pulley members to frictionally engage, respectively, the opposite sides of said V-belt and for allowing said tension operated pulley members to move axially relative to one another to vary the effective diameter of said second pulley in inverse proportion to variation in the effective diameter of said first pulley.

4,179,947

COUNTERBALANCED PUMPING SYSTEM

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

Filed Aug. 15, 1977, Ser. No. 824,346
Int. Cl.[2] F16H *29/02*
U.S. Cl. 74—89.2 7 Claims



1. Apparatus for articulating linearly reciprocal devices comprising:

a frame adapted for upright support placement;

a shaft mounted for rotation in said frame in substantially horizontal alignment;

motor means connected to assist in rotation of said shaft;

a first and second substantially circular mandrel secured in spaced relationship on said shaft;

a first sheave chain attached to said first mandrel and spirally wound upon itself in a first direction around the periphery thereof the free end of said first sheave chain being attached to said reciprocal device;

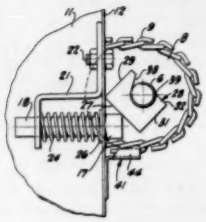
a second sheave chain attached to said second mandrel and spirally wound upon itself in a second direction around the periphery thereof; and

counterbalancing means connected to the free end of said second sheave chain, whereby the spiral windup of said first sheave chain is variably opposed by said second sheave chain according to said peripheries thereof to form an oscillary system.

4,179,948
SHAFT MOUNTING

Nils Lang-Ree, Los Altos, Calif., assignor to NPI Corporation, Burlingame, Calif.

Filed Mar. 27, 1978, Ser. No. 890,134
Int. Cl.[2] F16H 7/10
U.S. Cl. 74—242.15 R 9 Claims

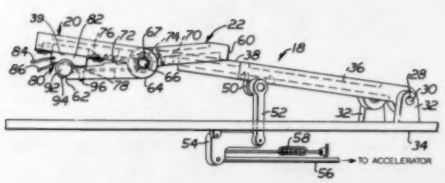


1. A shaft mounting comprising a frame including a planar strap having an opening therein, a shaft rotatable about an axis parallel to and spaced from the plane of said strap, a rotatable bearing block adapted to overlie said opening and having a groove therein of an extent adapted to engage less than a half-circumference of said shaft and defined by an arcuate surface the elements of which are parallel to said axis, said block having at least some flat bounding surfaces at right angles to each other and parallel to and at predetermined distances from said axis, means for supporting said block with one of said flat bounding surfaces parallel to said strap, and means for urging said one of said flat surfaces of said block away from said strap.

4,179,949
CONTROL PEDAL

Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jun. 28, 1978, Ser. No. 919,886
Int. Cl.[2] G01M 1/168; G01P 3/04; G01H 5/00
U.S. Cl. 74—474 7 Claims



1. In a vehicle (10) including a control pedal (18) having an accelerator portion (20), said accelerator portion (20) including a foot contact surface (38) and an underside surface (39), the improvement comprising:

a switch (80) mounted adjacent the underside surface (39);

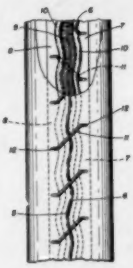
a switch actuator (92); and

means (22) for moving the switch actuator (92) relative to the switch (80), said means being connected to the accelerator portion (20) and having one end (62) including the switch actuator (92) adjacent the underside surface (39) and another end (60) adjacent the foot contact surface (38), said one end (62) movable toward the underside surface (39) adjacent the switch (80) in response to movement of the other end (60).

4,179,950
STEERING WHEEL COVER

James F. Valley, 6613 Hollis St., Emeryville, Calif. 94608

Filed May 31, 1978, Ser. No. 911,205
Int. Cl.[2] G05G 1/10; B65H 81/00
U.S. Cl. 74—558 7 Claims



1. A steering wheel cover comprising:

an annular band of soft flexible material having a length dimensioned for distension around a steering wheel rim and a width dimensioned for wrapping around said rim juxtaposing opposite side edges of said band;

said band being formed with hems at and extending longitudinally of said side edges and being perforated to provide means for interlacing said side edges; and

a nonelastic flexible cord mounted in and extending longitudinally of each of said hems between said perforations and said side edges, said cords and perforations being positioned for, and said cords having tensile strength requisite to thereby provide means for transmitting to said side edges the clamping action of said interlacing while relieving stress on the walls of said perforations, whereby, when said steering wheel cover is laced on a steering wheel through said perforations the force of stretching said cover is transmitted to said cords and tearing of said perforations is avoided.

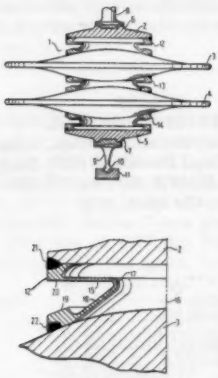
4,179,951
FLYWHEEL ROTOR PARTICULARLY SUITABLE FOR ACCUMULATING ENERGY

Frederik H. Theyse, Bensberg-Herkenrath, Fed. Rep. of Germany, assignor to Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands

Filed Dec. 10, 1976, Ser. No. 749,270
Claims priority, application Netherlands, Dec. 18, 1975, 7514749
Int. Cl.[2] F16F 15/30; F16D 3/52, 3/56
U.S. Cl. 74—572 3 Claims

1. A flywheel rotor suitable for accumulating kinetic energy of rotation at high rotational speed, in which the rotor is assembled from at least two separate coaxial flywheel components which are interconnected by means of an elastic metallic link, said elastic metallic link having the form of a solid of revolution comprising one single, relatively thin-walled bellows fold facing the axis of rotation, the bellows fold having two fold walls which are connected to each other by a bent-over portion, the bellows fold also having end edges which are affixed to the flywheel components adjoining the elastic link, one of said end edges at the location of its attachment to the respective flywheel component being thickened relative to the thickness of the adjacent fold wall, one fold wall of the bellows fold having the form of a truncated cone, the other wall of the fold being flat and located in a plane surface perpendicular to the axis of rotation of the rotor, said fold being provided with a

number of narrow, closed radial slits penetrating from the extremity of the fold partially into both fold walls equally, the



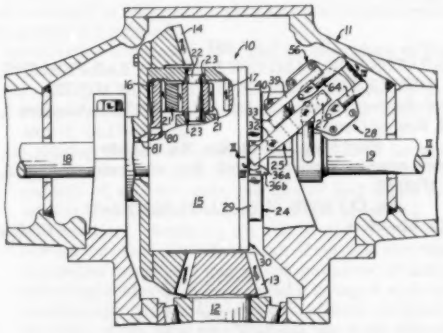
slits being uniformly distributed along the periphery of the fold.

4,179,952

LUBRICATION MEANS FOR A TORQUE PROPORTIONING DIFFERENTIAL

Frank E. Keske, Chillicothe, and David E. Hackett, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 24, 1975, Ser. No. 571,117
Int. Cl.[2] F16H *1/44*; F01M *1/08*
U.S. Cl. 74—710 **28 Claims**



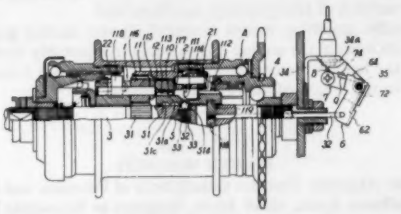
1. In a differential of the type comprising a pair of face gears, a rotatable carrier disposed between said face gears, pinion gear means rotatably mounted in bearing means on said carrier and meshing with said face gears for differentially permitting one face gear to rotate relative to the other face gear and lubrication means for supplying a lubricating and cooling fluid to said pinion gear means and said bearing means, the invention wherein said lubrication means comprises a double-acting pump means, inlet passage means for communicating fluid into each end of said pump means, outlet passage means for communicating fluid from each end of said pump means to said pinion gear means and said bearing means, actuating means operatively associated with each end of said pump means for drawing fluid into said pump means through said inlet passage means at one end thereof while simultaneously pumping fluid from the other end thereof to said outlet passage means and drive means for selectively actuating said actuating means.

4,179,953

GEAR TRANSMISSION CONTROL DEVICE FOR MULTIPLE-SPEED HUB FOR BICYCLES

Mitsugu Hanada, and Seiji Fukui, both of Sakai, Japan, assignors to Shimano Industrial Company, Limited, Osaka, Japan

Filed Apr. 14, 1977, Ser. No. 787,490
Claims priority, application Japan, Apr. 21, 1976, 51/45865
Int. Cl.[2] F16H *3/44*
U.S. Cl. 74—750 B **4 Claims**



1. A gear transmission control device for a multiple-speed hub for a bicycle, which hub houses the gear transmission within a hub shell and changes the driving force to be transmitted from a driving member to the hub shell by actuating a controller through a control wire, said device comprising:

(a) a fixed member fixed to the bicycle frame,

(b) an actuating arm pivotally supported to said fixed member through a pivot, said actuating arm swinging to actuate said controller, thereby changing the transmission,

(c) a control arm pivotally supported to said fixed member through said pivot, said control arm being shiftable independently of said actuating arm, said control arm carrying at one end the control wire fixed thereto, and

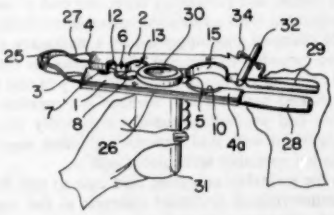
(d) an energy-storing spring insertably supported between said actuating arm and said control arm, said spring storing energy by swinging said control arm with respect to said actuating arm when said controller is, in the speed change, subjected to a resistance more than a prescribed value, said actuating arm being made swingable by the stored energy when the resistance is released, thereby moving said controller by said swinging.

4,179,954

JAR AND BOTTLE OPENER

Robert Whalen, 47-57 44th St., Woodside, N.Y. 11377

Filed Apr. 18, 1978, Ser. No. 897,556
Int. Cl.[2] B67B *7/00*
U.S. Cl. 81—3.44 **1 Claim**



1. A jar and bottle opener, comprising

first and second symmetrical elongated gripping members each having spaced opposite first and second ends, each of said gripping members having a first length-extending edge with a plurality of spaced substantially partially circular notches formed therein and an opposite second length-extending edge, the diameters of the notches varying from a minimum in the area of the first end to a maximum in the area of the second end;

a joining member of substantially resilient material bent in a generally V-shape and having a pair of elongated arms

angularly disposed relative to each other, each of the arms being affixed to the second edge of a corresponding one of the gripping members in a manner whereby the first edges of said gripping members are angularly disposed in facing relation relative to each other with the minimum diameter notches thereof closer to each other than the maximum diameter notches thereof;

handles extending from the second ends of the gripping members to facilitate urging said second ends toward each other to grasp a lid of a container between corresponding notches of said gripping members; and

handle mounting means mounted on the second gripping member at the second end thereof for adjustably mounting the handle thereof for movement in directions transverse to the length of said gripping member.

4,179,955

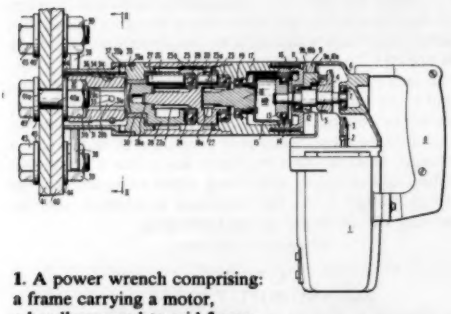
POWER WRENCH

Toshio Akiyoshi; Tsutomu Onishi, both of Fukuoka, and Shozo Haikawa, Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Terauchi Seisakusho, Kyoto, both of, Japan

Continuation-in-part of Ser. No. 683,574, May 6, 1976, abandoned, which is a continuation of Ser. No. 450,921, Mar. 13, 1974, abandoned. This application Aug. 1, 1978, Ser. No. 930,074

Int. Cl.[2] B25B *29/00*

U.S. Cl. 81—57.11 **4 Claims**



1. A power wrench comprising:

a frame carrying a motor,

a handle secured to said frame,

at least one speed reduction gear means having an input and an output, said input operatively coupled to said motor,

a case accommodating said speed reduction gear means,

a receptacle coupled to the output of said speed reduction gear means and projecting from one end of said case for engagement with a threaded rotatable workpiece element to be clamped and supported by a stationary element,

a sleeve mounted to one end of said case for rotation with said case and surrounding the periphery of said receptacle,

a bar-shaped anti-rotation member for rotation with said sleeve and projecting radially outwardly therefrom for engagement with said stationary element supporting said threaded rotatable workpiece, and

means for rotatably mounting said case to said frame under a predetermined frictional restraint at the input of said speed reduction gear means;

whereby, said anti-rotation member prevents rotation of the case due to clamping reaction force, but upon deformation or breaking of the anti-rotation member, said case rotates relative to said frame and said handle overcoming the frictional restraint to prevent clamping reaction torque transmission to the power wrench operator, and said power wrench further comprising means for mounting said sleeve for relative free rotation with respect to said case within a predetermined angle to permit said bar-shaped anti-rotation member to be rotated slightly during engagement of said receptacle to said threaded rotatable work piece without rotation of said case due to said predetermined frictional restraint and to thereby eliminate the necessity of rotating the handle to cause said anti-rotation member to move out of the way of a portion of the stationary element which would otherwise prevent said engagement.

4,179,956

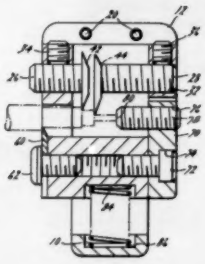
WIRE STRIPPING TOOL

Marshall J. Gooley, West Bloomfield, Mich., assignor to Daniels Manufacturing Corp., Bloomfield Hills, Mich.

Filed Jan. 16, 1978, Ser. No. 870,028

Int. Cl.[2] H02G *1/12*

U.S. Cl. 81—9.5 R **17 Claims**



1. A manually operable tool for stripping insulation from insulated wires comprising: a base structure; a cutter holding member mounted on said base structure and having at least one circular cutter blade adjustably mounted thereon eccentrically with respect to the center of said cutter blade, a cable supporting means mounted on said base structure, and means for spring biasing said cutter holding member and said cable supporting means toward each other.

4,179,957

APPARATUS FOR DAMPING NOISE IN BAR-FEEDING DEVICES OF SCREW-CUTTING MACHINES

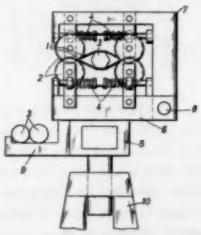
Wilhelm Sewing, Hagedorner Str. 151, D 4983 Kirchlengern 3, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,049

Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719687

Int. Cl.[2] B23B *13/08, 25/00;* B23Q *3/00*

U.S. Cl. 82—38 A **4 Claims**



1. Apparatus for damping noise in bar-feeding devices of automatic screw-cutting machines, especially for bars with a polygonal profile, the apparatus comprising at least one group of rollers composed of an upper pair of laterally spaced upright rollers and a lower pair of laterally spaced upright rollers, means supporting all of the rollers with their axes parallel to one another, an endless belt extending around each pair of rollers, the lower length of the upper belt and the upper length of the lower belt being unsupported between the rollers and

adapted to engage the top and bottom of a rotating and axially moving bar between them extending across the belts, whereby to support the rotating bar as it moves said lower and upper lengths of the belts in opposite directions, and resilient means urging the rollers in each pair laterally away from each other to maintain said belts taut.

4,179,958

METHOD FOR SHEARING HOT STRIPS AND DEVICE THEREFOR

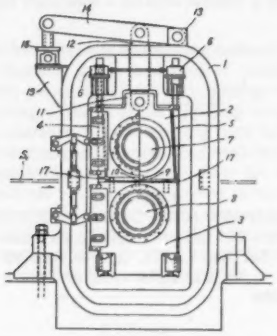
Susumu Nomura; Hiroyuki Okubo, both of Yokohama; Hiroshi Isozaki, Zushi; Tsutomu Hara, and Bunpei Masuda, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 791,048

Claims priority, application Japan, Apr. 30, 1976, 51-49613

Int. Cl.[2] B23D *25/12*

U.S. Cl. 83—37 **1 Claim**



1. A method for shearing a continuously traveling horizontally arranged hot strip into a plurality of successive sections, comprising the steps of:

(a) moving a horizontally arranged hot strip along its longitudinal axis;

(b) rotating a first horizontal blade about a horizontal parallel spaced axis above and transverse to the longitudinal axis of, said hot strip;

(c) rotating a second horizontal blade about a horizontal parallel spaced axis below, and transverse to the longitudinal axis of, said hot strip, the axes of said blades being initially contained in a common vertical plane; and

(d) progressively displacing the axis of one of said blades toward the other axis with the axis of said one blade being maintained horizontal, the path of movement of said one axis being contained in a plane that is arranged at an acute leading angle relative to said vertical plane in the direction of travel of the strip, whereby said one blade follows a non-circular locus during shearing and travels faster than the other blade in the direction of strip travel, thereby to eliminate the formation of needle-shaped burrs.

4,179,959

METHOD AND APPARATUS FOR THE CUTTING OF SPLIT TILES

Hans Lingl, Jr., Paris, Tenn., assignor to Lingl Corporation, Paris, Tenn.

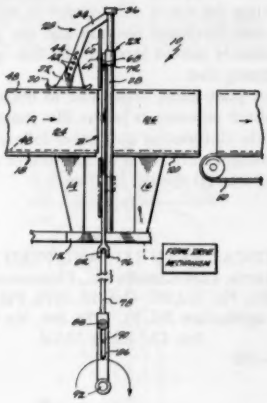
Filed Oct. 31, 1977, Ser. No. 846,938

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649409

Int. Cl.[2] B26D *1/56*

U.S. Cl. 83—37 **18 Claims**

2. Apparatus for cutting an extruded column of plastic material into segments comprising cutting means for cutting the extruded plastic column into segments without tearing the outer surface thereof, said cutting means arranged to move alternately back and forth with respect to said column between first and second positions with each alternate movement between said first and second positions comprising a cutting stroke, cutting drive means for moving said cutting means between said first and second positions, frame means for supporting said cutting means and at least that portion of said column adjacent the cut, frame drive means for moving said



frame and cutting means with respect to said column prior to and during each cutting stroke, wherein said cutting means includes a pair of cutting members, means for mounting each of said cutting members oppositely from one another so that each will cut into said column from opposite sides thereof during each cutting stroke, said mounting means being movably secured to said frame means and operatively connected to said cutting drive means.

4,179,960

FILM SPLICER

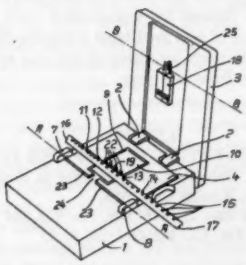
Rudolf Hanke, Monheim, Fed. Rep. of Germany, assignor to Hama Hamaphot K.G. Hanke & Thomas, Monheim, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,300

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751240

Int. Cl.[2] G03D *15/04*; B26D *7/14*

U.S. Cl. 83—175 **2 Claims**



1. In a film splicer including a base and a lid hingedly connected to the base for movement between lid-opened and lid-closed positions relative to the base and a cutting blade depending from the lid for trimming the adjacent ends of the to-be-spliced film lengths as the lid is brought into lid-closed position, the improvement in the form of a mechanism for compensating for the gap resultant from the passage of the cutting blade through the film lengths following severance comprising:

a slotted support plate of resilient material for upwardly supporting the adjacent ends of the to-be-spliced film lengths,

aligning means projecting from the support plate for accommodating sprocket holes of the to-be-spliced film lengths and holding the film lengths relative to the support plate,

a plunger having a width greater than the normal width of the slot of the support plate and depending from the lid for passage into the slot in a slot-widening stroke as the lid is moved into lid-closed position and the cutting blade is concomitantly moved through the film lengths and into the widening slot,

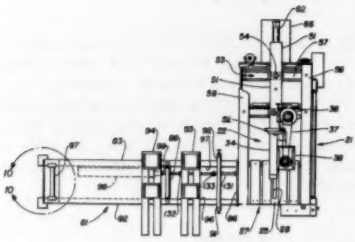
the support plate being returnable to initial position with concomitant movements of the film lengths on opposite sides of the slot toward each other following withdrawal of the plunger and cutting blade from the slot as the lid is retracted into lid-opened position.

4,179,961

VERTICAL BAND SAW AND FEED TABLE

Gerald R. Harris, 1230 Camelia Dr., Livermore, Calif. 94550

Division of Ser. No. 732,107, Oct. 13, 1976, Pat. No. 4,117,756.
This application Jul. 11, 1978, Ser. No. 923,557
Int. Cl.[2] B23D *55/04*
U.S. Cl. 83—206 **5 Claims**



1. A stabilization device for use in resisting backward tilting about a horizontal axis of a movable vise, said vise being formed for gripping of a work piece and mounted for reciprocation on viseways on a feed table to enable feeding of said work piece to a machine tool, such as a band saw, comprising:

a stabilizing bar formed to be rigidly secured to said vise and formed to extend a substantial distance from said vise in a direction away from said machine tool, said stabilizing bar being further formed for engagement with and bearing upon a portion of said feed table remotely of said vise to provide a pivot point for tilting of said vise at a substantial distance away from said vise.

4,179,962

COMBINED FLYING CUTOFF AND PUNCH

Hubert C. Crump, Galesburg, Ill., assignor to Butler Manufacturing Company, Kansas City, Mo.

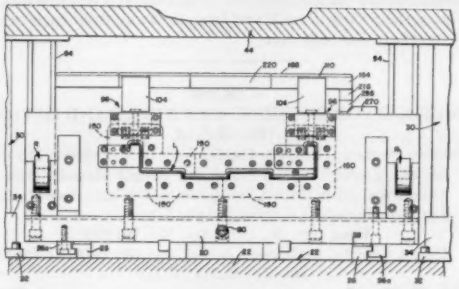
Filed Jun. 1, 1978, Ser. No. 911,684
Int. Cl.[2] B26D *1/56, 9/00*
U.S. Cl. 83—300 **20 Claims**

1. A flying panel cutoff and punch device comprising:

a slugless cutoff means and actuating means therefor for shearing panels of predetermined length from a continuous length of material;

a punch means on said slugless cutoff means for punching holes in a panel; and

punch actuating means on said cutoff means for actuating said punch while said cutoff means shears such panel from a length of material so that said punch means and said slugless cutoff means are actuated at the same time, said punch actuating means including a plurality of cams, said plurality of cams including a wedge block on the cutoff



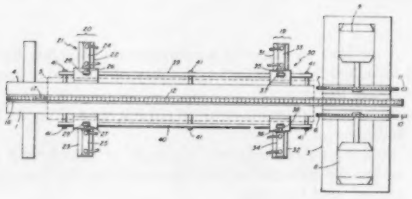
means and a retainer cam on a stationary member of the device.

4,179,963

SCRAG SAW MILL DOGGING SYSTEM

Lloyd E. Rhodes, 242 Lake St., Bellingham, Mass. 02019

Filed Jun. 8, 1978, Ser. No. 913,793
Int. Cl.[2] B27B *7/00, 29/04*
U.S. Cl. 83—409 **12 Claims**



1. A saw mill comprising:

(a) a pair of power driven saws;

(b) an elongated carrier for supporting a log to be passed through said saws;

(c) a pair of spiked dogs supported adjacent opposite sides of the position to be occupied by a log on said carrier;

(d) power operated means for driving each of said dogs toward said position along a path having a substantial component transverse to the longitudinal axis of the log, said path also having a substantial component directed toward said carrier, whereby, upon contact of said dogs with said log, the log will be locked against transverse motion and clamped against said carrier;

(e) independent driving means for engaging said log, so locked and clamped, and for propelling said log along a path extending through and beyond said saws;

(f) said dogs being supported on a carriage which is mounted to be moveable as the dogs are carried along by being locked to said log as it moves toward said saws;

(g) means for reversing the power supplied to said power operated means to reverse the direction in which said power operated means drives said dogs; and

(h) means, responsive to said carriage reaching a predetermined position adjacent said saws, for energizing said reversing means to disengage said dogs from said log.

4,179,964

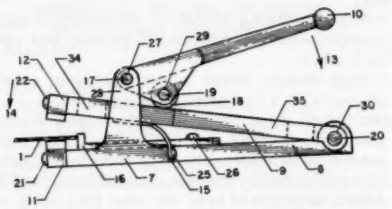
RIBBON CABLE SPLITTING DEVICE

James P. Kirkgasser, DeWitt, and Arthur C. Goldsmith, Lafayette, both of N.Y., assignors to K-G Devices Corporation, DeWitt, N.Y.

Continuation-in-part of Ser. No. 652,862, Jan. 27, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 774,891

Int. Cl.[2] B26D 5/10; H02G 1/12

U.S. Cl. 83—599 2 Claims



1. A device for separating and spacing conductive units of a ribbon-type electrical cable consisting of parallel insulated conductor units joined by a web of insulating material, said device comprising a pair of planar opposing engageable jaws each having a plurality of linear meshing teeth having longitudinal channel shaped cutting edges, said teeth being spaced to intermesh whereby said cutting edges shear the web between conductors without removal of insulating material from the conductors, the cutting and separating motion being substantially perpendicular to the length of the cable being cut, and one of said jaws being stationary and the other being movable to affect engagement and intermeshing of the teeth.

4,179,965

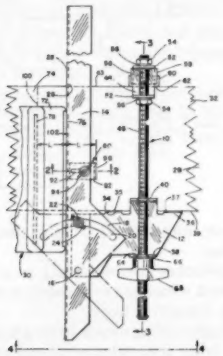
GUIDE FOR PORTABLE POWER TOOL

F. Walter Johnson, 2920 Floyd St., Sarasota, Fla. 33579

Filed Mar. 13, 1978, Ser. No. 885,975

Int. Cl.[2] B27B 9/04

U.S. Cl. 83—745 8 Claims



1. A guide for use with a portable tool having a cutter and a support shoe provided with a guiding edge, said guide comprising a support plate, a straight edge member having a guiding edge mounted on said support plate, and means for clamping said support plate to a workpiece comprising a pair of downwardly turned edge portions in said support plate, a pair of upwardly turned opposite coaxial ears in said support plate, aligned apertures in said ears, a single threaded rod passed through said aligned apertures, a clamping surface on a clamp member mounted on an end of said threaded rod, and a nut threading on said threaded rod and disposed such as to draw said clamping surfaces toward each other, said nut being of the type providing disengagement of its internally threaded bore with the thread of said threaded rod upon pivoting said nut with its axis at an angle to the axis of said single threaded rod.

4,179,966

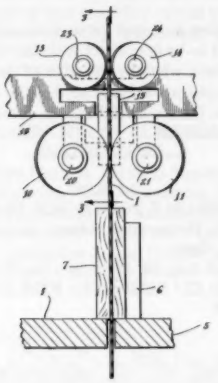
SENSOR FOR DETERMINING BAND SAW DEFLECTION AND FOR GUIDING THE BAND SAW BLADE

Oscar Ginnow, and Roger Ginnow, both of 68 Hopbrook Rd., Bethany, Conn. 06525

Filed Jan. 30, 1978, Ser. No. 873,209

Int. Cl.[2] B27B 13/10; B23D 55/08

U.S. Cl. 83—820 1 Claim



1. A band saw of the type including a band saw blade, a work table and guide wherein the improvement comprises:

(a) a first carriage with a first and second axle in a first horizontal plane and a third and fourth axle in a second horizontal plane, said carriage located above said work table;

(b) a first correcting roller rotatably mounted on said first axle with the said first axle and first correcting roller making an angle with the saw blade of between 15° and 30° and with the first correcting roller contacting the front portion of the saw blade behind the set and gullet areas of the blade with more than one-half of the width of the blade behind the point where the correcting rollers contact the blade;

(c) a second correcting roller rotatably mounted on said second axle with the said second axle and said second correcting roller making an angle with the saw blade of between 15° and 30° and with the second correcting roller contacting the front portion of the saw blade behind the set and gullet areas of the blade with more than one-half of the width of the blade behind the point where the correcting rollers contact the blade;

(d) a correction limiting rollers including a third roller mounted on said third axle and a fourth roller mounted on said fourth axle, said rollers being arranged so as to be adjacent to the trailing edge of the blade;

(e) a thrust roller mounted on said first carriage and arranged so as to be in contact with the trailing edge of the band saw blade;

(f) a second carriage with a first and second axle and a first horizontal plane and a third and fourth axle in a second horizontal plane, said carriage located below the work table;

(g) a first correcting roller rotatably mounted on the first axle of said second carriage with the said first axle and first correcting roller making an angle with the saw blade of between 15° and 30° and with the first correcting rollers contacting the front portion of the saw blade behind the set and gullet area of the blade with more than one-half of the width of the blade behind the point where the correcting rollers contact the blade;

(h) a second correcting roller rotatably mounted on the second axle of the second carriage with the said second axle and second correcting roller making an angle with the saw blade of between 15° and 30° and with the second correcting roller contacting the front portion of the saw blade behind the set and gullet areas of the blade with more than one-half of the width of the blade behind the point where the correcting roller contacts the blade;

(i) correction limiting rollers located on said second carriage including a third roller mounted on said third axle and a fourth roller mounted on said fourth axle with said rollers arranged so as to be adjacent to the trailing edge of the blade;

(j) a thrust roller mounted on said second carriage and arranged so as to be in contact with the trailing edge of the band saw blade whereby the edge of the correcting roller acts as a pivot for the blade so that the blade is steered in the direction from which the force comes so as to provide a smooth, clean cut.

4,179,967

VARIABLE TOOTH SAW BLADE

Calvin M. Clark, Bernardston, Mass., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Aug. 28, 1978, Ser. No. 937,549
Int. Cl.[2] B23D *61/12*; B27B *33/02*
U.S. Cl. 83—846 **10 Claims**

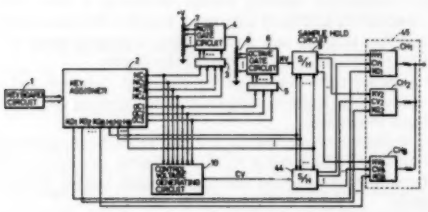
1. A saw blade having a toothed edge comprising a plurality of recurrent groups of teeth; each group including a series of teeth which are set angularly and alternately sidewise the same amount and which first decrease progressively in gullet depth and pitch and then increase progressively in gullet depth and pitch, said teeth having varying rake angles, the shorter teeth having a more positive rake angle than the longer teeth.

4,179,968

ELECTRONIC MUSICAL INSTRUMENT

Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 13, 1977, Ser. No. 841,717
Claims priority, application Japan, Oct. 18, 1976, 51-124528
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **7 Claims**



1. An electronic musical instrument in which tone pitch determining voltages corresponding to respective tone pitches of a plurality of keys and key corresponding control voltages corresponding respectively to said keys are produced separately upon depression of the keys, and said instrument comprising:

musical tone generating elements in which the pitch of the generated tones are determined principally according to tone pitch determining voltages, and in which the operation of said elements is modified by said key corresponding control voltages correspondingly to modify the characteristics of the generated tones, together with means for forming said key corresponding control voltages comprising:

a voltage generating circuit for generating a plurality of voltages which are different in polarity and value from each other;

a voltage division circuit whose both input terminals are connected to a first plurality of gates;

a gate control circuit for selecting the outputs of said voltage generating circuit by controlling said first plurality of gates in accordance with one of two kinds of information both established by depression of said keys, one kind being related to groups of keys, the other kind being related to keys within said groups, so as to cause said outputs to be applied to the input terminals of said voltage division circuit; and

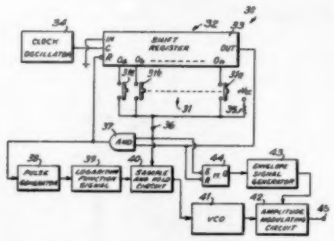
a second plurality of gates for gating out voltages produced by said voltage division circuit in accordance with the other of said two kinds of information thereby producing control voltages corresponding to the respective keys.

4,179,969

TONE GENERATOR FOR ELECTRICAL MUSIC INSTRUMENT

Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,061
Claims priority, application Japan, Sep. 12, 1977, 52-109632; Sep. 26, 1977, 52-115335
Int. Cl.[2] G10H *1/04, 5/00*
U.S. Cl. 84—1.01 **16 Claims**



1. A tone generating apparatus for an electrical music instrument comprising:

an array of switches corresponding to respective keys of a keyboard and which are selectively actuable by manipulation of the respective keys;

timing signal generating means having a repetitive operating cycle and being connected with said switches for providing timing signals in response to actuation of said switches, with each of said timing signals occurring at a time during said operating cycle which corresponds to the position in said array of the respective actuated switch;

exponential signal generating means for providing an exponential signal the value of which varies exponentially as a function of the length of time since the start of each said operating cycle of the timing signal generating means;

sample and hold means receiving said exponential signal and being operative to sample and hold a value of said exponential signal in dependence on the time of occurrence of one of said timing signals in said operating cycle; and

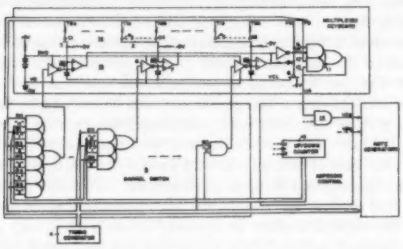
variable frequency oscillating means controlled in accordance with said value of the exponential signal which is

sampled and held for providing an output oscillation having a frequency determined by a selectively actuated one of said switches.

4,179,970
AUTOMATIC ARPEGGIO FOR MULTIPLEXED KEYBOARD

Alfred H. Faulkner, 1324 Portesuello Ave., Santa Barbara, Calif. 93105

Filed Jun. 22, 1977, Ser. No. 808,768
Int. Cl.[2] G10F *1/00*; G10H *1/02*
U.S. Cl. 84—1.03 **4 Claims**

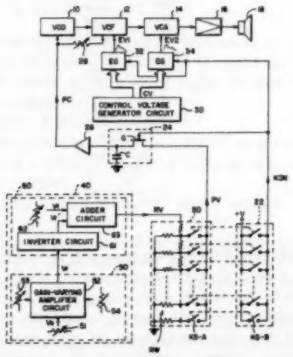


1. In a musical instrument of the type including a multiplexed keyboard and a multiplexed note generator system connected by a serial signal line to identify operated playing keys, an arpeggio system connected in circuit with the serial signal line and including a gating circuit operative cyclically at multiplex rate to pass a selected one of several multiplexed signals from a source in a group appearing on the serial signal line while blocking the remainder, and an automatic sequencing circuit operated to control said gating circuit in response to receipt of a multiplexed signal identifying a chord to selectively pass the multiplexed signals representing individual notes of the chord in ascending sequence.

4,179,971
PITCH BEND APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Toshiyuki Takahashi; Masahiko Koike, and Haruyuki Suzuki, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 21, 1978, Ser. No. 944,293
Claims priority, application Japan, Sep. 24, 1977, 52-114914; Sep. 24, 1977, 52-128623
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **4 Claims**

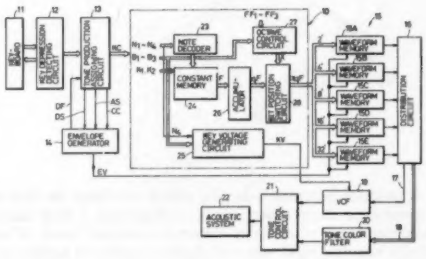


1. In an electronic musical instrument of the type wherein a pitch voltage that is different for each of the keys is generated, a voltage-controlled oscillator is controlled by means of a pitch voltage corresponding to a depressed key, and a musical tone signal of a pitch corresponding to said depressed key is synthesized, and which further comprises a pitch bend means; the combination of a gain-varying amplifier circuit to which input terminal is applied a reference voltage, a first variable resistor which is so connected in said amplifier circuit that the gain of said amplifier circuit is changed depending upon the position of a slider for operating the pitch bend means, and a second variable resistor which is so connected in said amplifier circuit that the gain of said amplifier circuit is variably set to determine the varying width of the pitch bend, each of said pitch voltage being formed based on an output voltage taken out from the output side of said amplifier circuit responsive to the change of resistances of said first and second variable resistors.

4,179,972
TONE WAVE GENERATOR IN ELECTRONIC MUSICAL INSTRUMENT

Teruo Hiyoshi; Akira Nakada; Tsutomu Suzuki; Eiichiro Aoki, and Takatoshi Okumura, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 13, 1977, Ser. No. 841,716
Claims priority, application Japan, Oct. 18, 1976, 51-124529
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.11 **10 Claims**



1. A note wave generator in a keyboard electronic musical instrument, which comprises:

memory means for storing constants corresponding to musical tone frequencies included in one out of a plurality of groups into which keys of said keyboard are divided separately on the octave basis;

accumulator means for repeatedly adding said constants read out of said memory means in response to depression of a selected key, said accumulator means providing the resultant accummulated data in parallel binary format; and

bit position switching means for shifting said parallel binary format data provided by said accumulator means by a number of bit positions corresponding to the octave range designated by said selected key so as to obtain data which varies repeatedly according to the frequency of the tone to be produced.

4,179,973
MUSICAL SHAKER

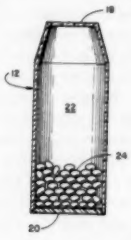
Wesley C. White, San Diego, Calif., assignor to Partee Products, San Diego, Calif.

Filed Feb. 10, 1978, Ser. No. 876,569
Int. Cl.[2] G10D *13/06*
U.S. Cl. 84—402 **4 Claims**

1. A sound generating device, comprising:

a generally tubular casing having first and second closed ends, said first closed end having a smaller diameter than said second closed end, said casing and said ends being

made from a hard plastic material and forming a cavity therewithin; and



a plurality of popcorn kernels partially filling said cavity for generating an audible sound upon vibration of said device.

4,179,974

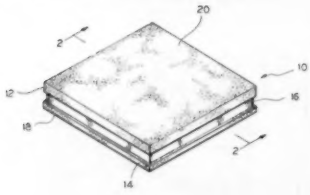
PERCUSSION ACCESSORY

Rick Trankle, 3717 N. Newland, Chicago, Ill. 60634

Filed Jul. 7, 1978, Ser. No. 922,555

Int. Cl.[2] G10D *13/08*

U.S. Cl. 84—411 P **4 Claims**



1. A practice percussion device which simulates the feel of a real cymbal or drum when struck, comprising: a first smooth rectangular layer of resilient material; a second layer of substantially heavier, rigid material slightly smaller in surface area than said first layer and affixed to the center of said first layer so that said first layer extends beyond said second layer on all sides; and a third rectangular layer of resilient material approximately equal in surface area to said first layer and affixed to said second layer so that said third layer extends beyond said second layer on all sides, wherein said device maintains a vertical position when balanced on one edge of said first and third layers and struck on the opposite edge with the ordinary force applied to a cymbal, and resists lateral movement when struck on said first layer while resting horizontally on a suitable surface.

4,179,975

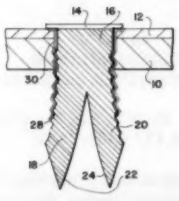
ANCHORING NAIL

John Forcina, 7209 Myrtle Ave., Glendale, N.Y. 11227

Continuation of Ser. No. 765,925, Feb. 7, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 893,192

Int. Cl.[2] F16B *15/04*

U.S. Cl. 85—23 **9 Claims**



1. A self-anchoring nail, comprising a head portion and a spring steel shank portion integral therewith and depending therefrom, said shank portion forming a pair of separate leg members, said leg members having a pair of free ends, said pair of free ends being normally biased apart, each of said leg members having at least one inner planar side extending along the length thereof, said planar side defined by converging planes along the center of said shank, a first corrugated surface defined on at least a portion of the outer surface of said shank and on at least a portion of the outer surface of each of said leg members, a compressible collar having a second corrugated surface along at least a portion of the inner wall thereof and frictionally engaging said shank by cooperating with said first corrugated surface for urging said leg members towards each other disposing said converging planes into substantially parallel alignment when said collar and said shank is disposed in an undriven state, a third corrugated surface defined along at least a portion of the exterior surface of said compressible collar, one end of said collar being located adjacent said head portion, said one end having a flange-like portion extending radially outwardly from said inner wall, said flange-like portion having a lateral annular-like surface thereof extending normal to the longitudinal axis of said shank, said flange-like portion of said collar being disposed located intermediate said head portion and the free ends of said pair of leg members and whereby said second corrugated surface is disposed entirely covering said first corrugated surface when said collar and said shank are in said undriven state, said collar being disposed upwardly towards said head as said nail is driven into a work piece into a driven state whereby said collar is disposed along the length of said shank portion towards said head and uncovers at least a portion of said free ends of said leg members such that said at least a portion of said free ends of said leg members are free to be disposed apart and whereby said flange-like portion is disposed into touching engagement with said work piece and with said head and whereby said second corrugated surface uncovers a portion of said first corrugated surface disposing said third corrugated surface and said portion of said first corrugated surface in side by side co-axially aligned relationship with each other.

4,179,976

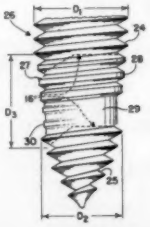
EXTRUDING AND TAPPING SCREW AND BLANK FOR MANUFACTURE OF SUCH SCREW

Henry A. Sygnator, Arlington, Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 3, 1978, Ser. No. 883,061

Int. Cl.[2] F16B *25/00*

U.S. Cl. 85—47 **6 Claims**



1. An extruding and thread-forming screw fastener including a shank with a head at one extremity and a leading end at the other extremity; the shank comprising three regions: a first, threaded, holding region adjacent the head with a substantially uniform crest diameter throughout its axial extent; a second point extremity region comprising a generally conical, threaded gimlet point at the leading end which is effective to create an initial thread pattern in an aperture wall of a workpiece, the maximum crest diameter of the gimlet point being less than the crest diameter of the first threaded region; and a

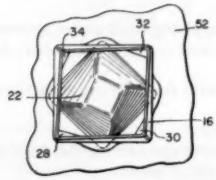
third, thread-forming and extruding region intermediate the first and second regions, the third region comprising a pair of dissimilar, opposing peripheral segments, one of said peripheral segments configured so that at any given axial location along said third region said one peripheral segment extends a greater radial distance from the axis of the fastener than the opposing dissimilar segment, said one peripheral segment including a plurality of pitches of thread indentations which are partially formed as to depth of impression including a plurality of pitches which are both partially formed in regard to the circumferential extent and depth of impression, the partial thread indentations following the same helix as the thread formations on the first and second regions, the lowermost partial thread indentation being spaced from the associated uppermost thread convolution on the second region a distance not exceeding two pitches, the uppermost partial thread convolution being spaced from the associated lowermost thread convolution on the first region a distance substantially equal to the pitch of the thread on said first region, said partial threads being effective to reconfigure the initial thread pattern into partial threads by working and extruding the wall of the aperture, the other of said opposing dissimilar segments being substantially void of thread formations, said threadless segment being operative to a least partially wipe away the partial threads which have been formed by said opposing segment to further work and extrude the aperture wall, the radial outermost portions of said one peripheral segment being tapered downwardly toward the gimlet point at an angle not greater that 6° to the axis of the fastener, thereby forming a gimlet point fastener with a thread-forming and extruding section which minimizes the drive torque required to apply such a fastener to a workpiece.

4,179,977

ENCAPSULATED FASTENER

Harold S. van Buren, Jr., Lincoln, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 14, 1978, Ser. No. 896,522
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—81 **11 Claims**



1. A fastener for insertion and retention in an aperture in a panel and for receiving a threaded element that clamps an article to the panel, said fastener being formed as a unitary component comprising:

A. a relatively flat head portion
  i. including first and second opposed major surfaces, and
  ii. defining a through opening between said surfaces;

B. a shank portion
  i. extending from the second major surface of said head portion,
  ii. defining an interior hollow space and and an open end,
  iii. having a cross sectional shape and size substantially matching that of the panel aperture in which the fastener is to be received,
  iv. being resiliently inwardly flexible from its sides to allow its passage through the panel aperture, and
  v. being resiliently expansible when said head portion engages the panel to retain said fastener in the aperture; and

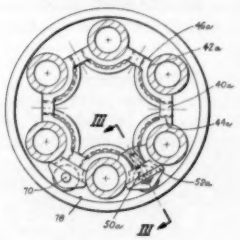
C. a barrel portion
  i. extending from the second major surface of said head portion within the interior hollow space defined by said shank portion,
  ii. defining an interior, threaded element receiving bore communicating with the opening in said head portion,
  iii. having a closed end,
  iv. having a noncircular cross-sectional shape defining external corners that are normally spaced from the interior hollow space defining portions of said shank portion, and
  v. being adapted to twist relative to said shank portion to cause the respective corners of said barrel portion to engage against the inside surface of said shank portion and bulge said shank portion outwardly responsive to the tightening of the threaded element into said bore to provide for further resistance to removal of said fastener from said aperture and secure clamping of the article to the panel.

4,179,978

CLAMP

Robert G. Kirkpatrick, Shelburne, and Ronald R. Snyder, Milton, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Dec. 23, 1977, Ser. No. 863,986
Int. Cl.[2] F41D *7/04*
U.S. Cl. 89—12 **7 Claims**



1. A rotating battery gun comprising:

a housing,

a barrel cluster journaled for rotation about a longitudinal axis with respect to said housing and including

a rotor,

a plurality of gun barrels, each respectively secured to said rotor, and extending longitudinally therefrom, each of said gun barrels having a respective longitudinal axis and having a respective plurality of transversely extending surfaces; and

clamp means secured to each of said plurality of gun barrels and pressing against said respective plurality of transversely extending surfaces to preclude rotation of said surfaces about the respective longitudinal axis of the respecitve barrel.

4,179,979

BALLISTIC ARMOR SYSTEM

Richard L. Cook, Phoenix, Ariz.; William J. Hampshire, Bellevue, Wash., and Robert V. Kolarik, North Canton, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

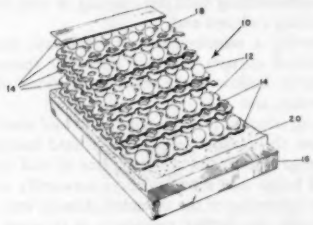
Filed May 10, 1967, Ser. No. 638,699
Int. Cl.[2] F41H *5/16*
U.S. Cl. 89—36 A **5 Claims**

1. In an armor system matrix, the combination of

a plurality of very hard substantially uniformly geometric shaped objects arranged in parallel layered patterns whereby each object is substantially in contact with those adjacent thereon on all sides, said objects being spherically shaped with larger spheres adjacent to the normally outward and exposed surface,

a material of great tensile strength interlaced between and

around adjacent objects to be in tension while supporting the objects in their aligned relation, and



an adhesive means to bond the objects and materials of the matrix into a solid and integral form.

4,179,980

HYDRAULIC BRAKE BOOSTER

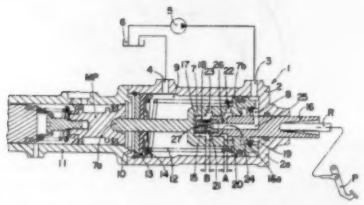
Masahiro Kito, Nagoyashi, and Yoshiharu Adachi, Gamagorishi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1977, Ser. No. 782,436

Claims priority, application Japan, Apr. 3, 1976, 51-37394; Apr. 17, 1976, 51-44000

Int. Cl.[2] B60T *13/16*

U.S. Cl. 91—6 **4 Claims**



1. A hydraulic brake booster for actuating an actuating piston in a master cylinder comprising:

a cylinder, a power piston slidable within said cylinder and dividing the interior of said cylinder into a hydraulic fluid inlet chamber on one side of the power piston in open communication with a fluid source and a hydraulic fluid outlet chamber on the other side of the power piston in open communication with a fluid reservoir, the inlet and outlet chambers being normally in open fluid communication with each other,

a manually actuable input piston means slidably received in part within said power piston and connected to a brake pedal,

an output member extending from said power piston and adapted to be connected to the actuating piston in the brake master cylinder,

a reaction chamber defined by a portion of said power piston and an acting face of said input piston and being normally in open fluid communication with said outlet chamber,

means for establishing first and second fluid flow paths between said inlet chamber and said outlet chamber,

a first fluid control means for restricting fluid flow from said inlet chamber to said outlet chamber through said first flow path in proportion to a magnitude of displacement of said input piston relative to said power piston during a first stage of said relative displacement to thereby exert a pressure differential between said inlet and outlet chambers,

a second fluid control means for restricting fluid flow from said reaction chamber to said outlet chamber through a portion of said second flow path in proportion to a magnitude of displacement of said input piston relative to said power piston during a second stage of said relative displacement and with said first fluid flow path being substantially blocked, and

a pressure transmitting control means positioned in the second fluid flow path between said inlet chamber and said reaction chamber such that pressure within said reaction chamber is maintained lower than that within said inlet chamber by a predetermined magnitude throughout said first stage and until said second fluid flow path becomes substantially blocked by said second fluid control means in said second stage to minimize the reaction force exerted against the brake pedal during said first stage and thereby promote rapid depressing thereof by an operator.

4,179,981

DEVICE FOR SEQUENTIALLY SUPPLYING SEVERAL HYDRAULIC MOTORS

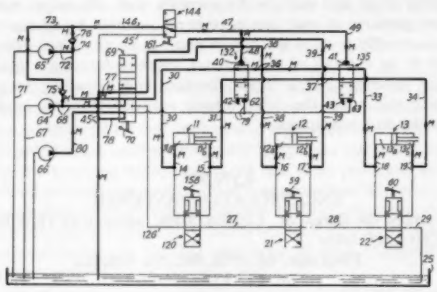
Victor Yeou, Meaux, France, assignor to Poclain, Le Plessis-Belleville, France

Division of Ser. No. 733,957, Oct. 19, 1976, abandoned. This application May 11, 1978, Ser. No. 905,362

Claims priority, application France, Oct. 30, 1975, 75 33215

Int. Cl.[2] F15B *13/04*

U.S. Cl. 91—33 **2 Claims**



1. A circuit for supplying fluid under pressure to fluid motors each having at least one drive chamber, the circuit comprising:

first, second and third fluid motors each having at least one drive chamber;

a fluid distributor;

connecting means for connecting the fluid distributor to a source of fluid under pressure;

a first conduit connecting a drive chamber of one of said motors to the fluid distributor, said fluid distributor being selectively operable to isolate said drive chamber or to connect said drive chamber to said connecting means;

a second conduit for connecting the first conduit to a second of said motors;

a third conduit for connecting the first conduit to the third of said motors;

a fourth conduit for connecting the fluid distributor to the first motor through a first distributor, the second motor through a second distributor, and the third motor through a third distributor, the first, second and third distributors having a closed position blocking said fourth conduit and at least one open position allowing flow through said fourth conduit;

first and second sequence valves interposed respectively in said second and third conduits, the first sequence valve being adapted to interrupt the second conduit when the pressure in the first conduit falls below a first predetermined value, and the second sequence valve being adapted to interrupt the third conduit when the pressure in the first conduit falls below a second predetermined value wherein each sequence valve is provided with a main fluid oper-

ated control device which is connected to the first conduit;

wherein said connecting means comprises first and second supply conduits adapted to be connected to respective sources of fluid under pressure;

said fluid distributor including means for selectively coupling one or both of said supply conduits to the first conduit;

a secondary fluid operated control device coupled to each sequence valve in opposition to the corresponding main fluid operated control device; and

said fluid distributor further includes means for connecting the secondary fluid operated control devices to a source of fluid under pressure when one only of the supply conduits is connected to the first conduit and said first, second and third distributors are in their open positions.

4,179,982

DEVICE FOR DETECTING POSITION OF HYDRAULIC CYLINDER

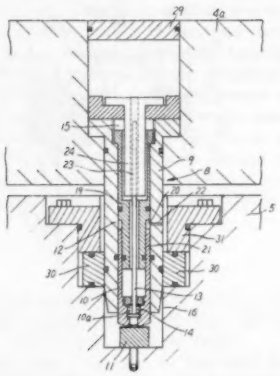
Shigeo Saotome, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,436

Claims priority, application Japan, Oct. 5, 1976, 51/119583

Int. Cl.² F01B *31/12*

U.S. Cl. 92—5 R **6 Claims**



1. A hydraulic cylinder position detecting device wherein an outer cylinder is securely fitted into a cylinder body or a piston coaxially thereof and slidably extended into the piston or the cylinder body; an inner cylinder is slidably fitted over one end portion of said outer cylinder; and an inner cylinder biasing mechanism is provided for forcing a lower or upper end of said inner cylinder against a seat attached to the piston or cylinder body respectively.

4,179,983

HYDRAULIC PERCUSSIVE MACHINES

Trevor E. Wallace, Bryanston, South Africa, assignor to The Steel Engineering Company Limited, Roodepoort, South Africa

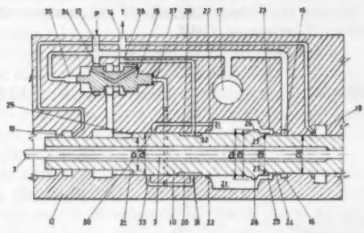
Filed Mar. 9, 1977, Ser. No. 775,992

Claims priority, application South Africa, Mar. 17, 1976, 76/1650

Int. Cl.² F01B *11/02*

U.S. Cl. 92—85 B **4 Claims**

1. In a hydraulic percussive machine comprising a cylinder, a piston arranged to reciprocate in the cylinder to perform a power stroke and a return stroke, an inlet for liquid at high pressure, said piston having opposed work and return stroke pressure responsive areas disposed, respectively, in first and second cylinder chambers, an outlet for liquid at low pressure, a first space in the cylinder connected to the inlet, a cushioning flange on the piston which moves with substantial clearance in the first space, a second space of lesser diameter than the first space and leading from the first space and into which the flange can move to close the second space on overtravel of the piston during the power stroke to trap fluid into the second space so that a dashpot action takes place, the flange moving out of the second space during said return stroke, the improvement comprising an annular timing groove on the piston, timing ports in the cylinder, the timing groove and ports being so disposed as to connect the first space to the outlet when the flange is in the second space, thereby to facilitate the return stroke of the piston, means to disconnect the first space from inlet when the flange is in the second space, and said second space defining a cushioning chamber interposed between said cushioning flange and said first space disconnect means.



4,179,984

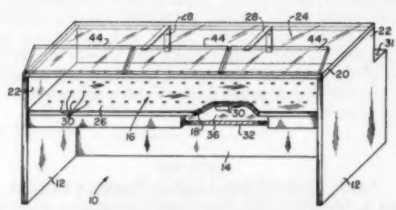
SLIDE MOUNTING WORK STATION

Raymond A. Gorcey, 131 Dean St., Hicksville, N.Y. 11801

Filed Sep. 5, 1978, Ser. No. 939,662

Int. Cl.² F23J *11/00*

U.S. Cl. 98—115 LH **14 Claims**



1. In an apparatus for use in carrying out slide mounting operations utilizing at least a substance producing toxic fumes,

a substantially horizontally disposed work surface,

wall means upstanding from said work surface about the periphery thereof,

cover means supportedly disposed on said wall means and spaced from said work surface to define a slide mounting work enclosure area bound by said work surface and cover means and by said wall means peripherally connecting and separating the same,

a chamber disposed beneath at least a portion of said work surface and connected with a source of negative pressure for applying a vacuum to said chamber,

a plurality of holes defined in and through said work surface and communicating with said chamber and the negative pressure applied thereto to enable withdrawal through said plural openings of toxic fumes present in said work enclosure area for removing therefrom and cleansing the environment therein of the toxic fumes,

and an opening defined in said upstanding wall means between said work surface and spaced cover means for providing such limited access into said work enclosure area that only a user's hands and arms are permitted to enter into the work enclosure area thereby protecting the

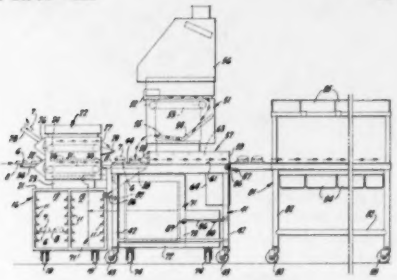
user's vulnerable upper body sensory portions from the toxic fumes within the work enclosure area by the interposition of said cover means between the toxic fumes and the upper body portions of the user.

4,179,985

SANDWICH COOKING AND ASSEMBLING UNIT

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and John S. Brown, Half Moon Bay, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Oct. 19, 1978, Ser. No. 952,631
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—339 **12 Claims**



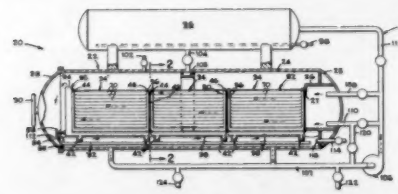
1. A sandwich cooking and assembling unit comprising a storage compartment for a tray carrying a bun heel and a bun crown, a bun grill disposed directly above said storage compartment and including a tray conveyor and a crown conveyor both advancing in a predetermined direction from an upstream end to a downstream end, a product conditioning tunnel having an entrance table at an upstream entrance and having an exit at a downstream end, means including a straddle frame for supporting said product conditioning tunnel with said table substantially even with and adjacent said downstream end, a freezer compartment having an access opening thereto and disposed beneath said straddle frame with said access opening adjacent said storage compartment, and a patty broiler including an inlet and an exit both on the upstream end of said patty broiler and arranged on and directly above said product conditioning tunnel.

4,179,986

LOW LIQUID VOLUME RETORT SYSTEM

Samuel A. Mencacci, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 16, 1976, Ser. No. 751,923
Int. Cl.[2] A23L *3/02, 3/10*
U.S. Cl. 99—359 **13 Claims**



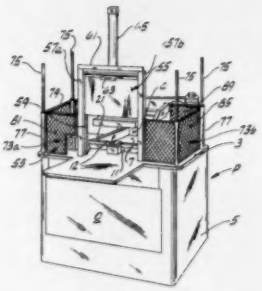
1. In a low liquid volume retort system including means defining a pressure vessel, closure means for selectively opening and closing said pressure vessel for loading and unloading containers therefrom, means defining a tunnel in said pressure vessel having an inlet end and an outlet end and within which the containers are supported during heat treatment, means for circulating at least a container heating heat treatment liquid from the inlet end to and through the outlet end of said tunnel, and means for introducing a gaseous medium into said pressure vessel for maintaining a superatmospheric pressure therein; the improvement which comprises overflow means at the outlet end of said tunnel having an overflow edge over which at least the container heating liquid in the tunnel is discharged, said overflow edge being disposed above the level of the uppermost containers in said tunnel for completely submerging all containers, and means for collecting the overflowing container heating liquid in a shallow pool in the bottom of said vessel and externally of said tunnel for recirculation through said tunnel.

4,179,987

SAFETY APPARATUS FOR A BACON PRESS OR THE LIKE

Daniel Dohm, Jr., University City, Mo., assignor to Cashin Systems Corp., Long Island, N.Y.

Filed May 22, 1978, Ser. No. 908,536
Int. Cl.[2] B30B *15/32;* F16P *7/00*
U.S. Cl. 100—53 **10 Claims**

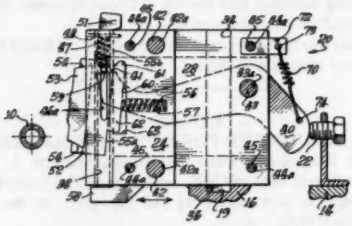


1. Safety apparatus for a press or other machine, said press having one or more parts movable during operation thereof, said movable parts being capable of causing injury to the operator of the press in the event the operator inadvertently leaves his hands or other parts of his body in position where they may be contacted by the movable parts of the machine during operation, said safety apparatus comprising a door positioned between the movable parts of the press and the operator when the latter is in his normal position while operating the press and being movable from an open position in which the operator has access to the movable parts of the press for placement or removal of work from the press to a closed position in which access to the movable parts of the press is blocked, and means actuable by the door upon the door being moved to its closed position for initiating operation of the press and actuable by movement of the door from its closed position for terminating operation of the press, said door having handle means toward the operator and being thereby manually movable by the operator downwardly to its closed position and upwardly from its closed position during the operation of the press, said means actuable by said door comprising a pair of electrical switches serially connected together, a first of said switches being at the upper end of the door when in its closed position, the second of said switches being at the lower end of the door when in its closed position, said safety apparatus further comprising means for raising the door upon completion of an operating cycle of the press.

4,179,988
STAMPING DEVICE FOR ROTATING WORKPIECES

Jack Rath, 9823 Kincardine Ave., Los Angeles, Calif. 90034

Filed Apr. 10, 1978, Ser. No. 894,930
Int. Cl.[2] B41F *17/22*
U.S. Cl. 101—7 16 Claims

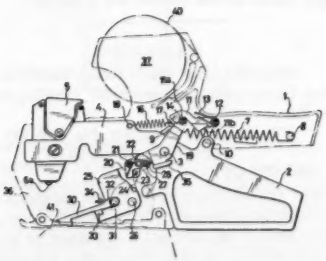


1. A stamping device adapted to be mounted on the tool slide of a machine such as a lathe or screw machine for imprinting characters or other insignia into the surface of a work piece held in the rotating chuck of said machine; said stamping device comprising a stamp element having raised characters on the outer surface thereof, means responsive to movement of the tool slide to its outermost position to move the stamp element to a relatively withdrawn position and to latch it in said withdrawn position, means to bias said stamp element from said withdrawn position, and means responsive to engagement of the stamp element with the peripheral surface of the rotating work piece upon inward movement of the tool slide to an innermost position to release said stamp element from said latched withdrawn position to permit said biasing means to move the surface of the stamp element tangentially with the rotating work piece to cause imprint of said raised characters or other insignia into the material of said work piece.

4,179,989
CONSTANT PRINTING PRESSURE MECHANISM FOR PORTABLE LABEL PRINTING AND APPLYING MACHINE, OR THE LIKE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Apr. 15, 1977, Ser. No. 787,937
Claims priority, application Japan, Apr. 26, 1976, 51-46606
Int. Cl.[2] B41J *3/00, 5/00;* B41F *1/54*
U.S. Cl. 101—291 10 Claims



1. A constant printing pressure mechanism for a label printing machine:

said label printing machine comprising an operating lever movable between an operating condition and a released condition; a printing head attached to said operating lever and movable therewith toward a platen;

a platen disposed in opposition to said printing head so that a label on said platen may be imprinted by said printing head;

said constant printing pressure mechanism comprising: platen raising means for raising said platen against said printing head, said platen raising means comprising an action lever movable with respect to said platen; said action lever including engageable means;

action lever engaging means normally in engagement with said engageable means for restraining motion of said action lever under the influence of a constant pressure spring;

a constant pressure spring connected with said action lever and adapted to be charged as said operating lever is being moved to its said operating condition, thereby to bias said action lever to move in one direction, which said movement of said action lever is restrained by said action lever engaging means;

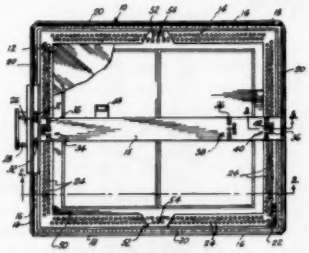
release means connected with said operating lever for releasing the engagement between said action lever engaging means and said engageable means upon motion of said operating lever over a predetermined distance towards said operating condition, thereby releasing the charged said spring to discharge and to move said action lever in said one direction, and said predetermined distance is such that said printing head is in condition to be engaged by a label on said platen when said platen is raised;

first impact means connected with said action lever to move therewith; second impact means connected with said platen; said first and said second impact means being so placed that after predetermined motion of said action lever in said one direction thereof under the influence of the discharging said spring, said first and said second impact means meet, and said platen and said impact means being so placed and so connected that upon such meeting of said first and said second impact means, said platen moves to said print head.

4,179,990
METHOD FOR MAKING LITHOGRAPHIC PRINTING PLATES

Frank J. Radencic, 7932 Haskell, Kansas City, Kans. 66109

Division of Ser. No. 631,038, Nov. 12, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,011
Int. Cl.[2] B41C *1/10, 1/12;* G03F *3/04*
U.S. Cl. 101—467 2 Claims



1. The method of reproducing multi-color images by the lithographic printing process comprising the steps of:

(a) preparing a desired image upon a graphic arts medium, including the emplacement of linear register marks on said medium, said marks comprising at least two spaced segments of the horizontal bisector of said image and at least two spaced segments of the vertical bisector of said image;

(b) reproducing said image, and said register marks photographically, successively using a series of preselected light filters to thereby obtain a plurality of transparencies of the image and register marks wherein each transparency corresponds to a respective color in the printing process;

(c) circumscribing an area of preselected size and configura-

tion on a transparency carrier while the latter is mounted within a precision register layout frame,

(d) marking a predetermined location for one of said transparencies within said circumscribed area on the carrier by using said frame as a measuring guide to draw single intersecting horizontal and vertical lines through the location midpoint,

(e) positioning said one transparency upon said carrier while the latter is under-lighted, aligning said register marks with said lines, and subsequently affixing said one transparency to said carrier,

(f) providing horizontal and vertical linear marks through the midpoint of said circumscribed area using said frame as a measuring guide;

(g) securing a second transparency, containing an image of two perpendicularly intersecting line segments, to said carrier at the midpoint of said circumscribed area after superimposing said segments over said marks,

(h) removing the portions of said carrier beneath said transparencies to form a complex exposure assembly;

(i) overlaying said exposure assembly on a photosensitive metallic plate and exposing the plate to a light source, thereby producing a one-color lithographic plate;

(j) successively repeating steps (c) through (i) for each transparency until lithographic plates corresponding to each of said transparencies are produced;

(k) printing a first color impression of the image contained on one of said plates including a first centrally located, perpendicular cross corresponding to said intersecting line segments;

(l) overprinting a second color impression on said first impression, said second impression being produced by a second of said plates and including a second centrally located perpendicular cross corresponding to said intersecting line segments, said overprinting step including superimposing said impressions such that said crosses coincide with one another; and

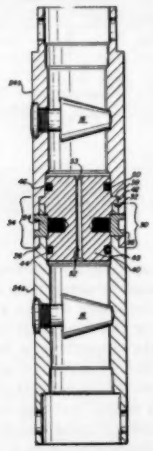
(m) repeating said step (l) for each of the remaining plates, thereby producing a full multicolor reproduction of the original image.

4,179,991

PERFORATING GUN BARREL

Robert B. Echols, and William J. Berry, both of Pampa, Tex., assignors to Titan Specialties, Inc., Pampa, Tex.

Filed May 26, 1978, Ser. No. 910,007
Int. Cl.[2] E21B *43/11, 43/116*
U.S. Cl. 102—21.6 **9 Claims**



9. In a perforating gun barrel where two tubular sections are adapted to carry explosive charges with one section positioned end-to-end with the other section in overlapping relation to define a coupling location; the combination comprising:

(a) a generally cylindrical coupling member at said coupling location disposed entirely internally of said tubular sections and having opposite ends slightly tapered with outwardly facing grooves, at least one at each end, to receive O-rings for establishing a pressure seal at each end of said coupling member and having a circumferential shoulder intermediate said grooves and

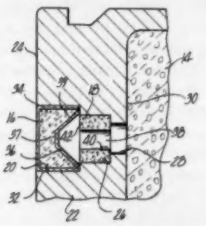
(b) at least one fastening means common to both said sections and said coupling member.

4,179,992

PRIMER-IGNITER FOR GUN PROPELLANTS

Jawaharlal Ramnarace, Dana Point, and William A. Wood, Newport Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1978, Ser. No. 893,637
Int. Cl.[2] F42B *19/10, 5/00*
U.S. Cl. 102—45 **9 Claims**



1. In a small caliber ammunition cartridge casing having a base and a tubular side wall extending therefrom: an explosive train for igniting the main propellant in the cartridge, comprising a first large diameter cavity extending into the casing base from its external face, a second slightly smaller cavity extending axially from the inner limit of the first cavity, and a still smaller passage extending axially from the second cavity to the inner surface of the casing end wall; a percussion type primer seated in the first cavity for generating a flame and hot particles in the direction of the second cavity; and a shock-resistant booster charge of annular configuration in the second cavity for receiving the flame front generated by the primer; said booster charge having a central hole therethrough of a diameter slightly smaller than the aforementioned passage, whereby the generated flame impinges on the inner edge surface of the hole as said flame moves toward the passage.

4,179,993

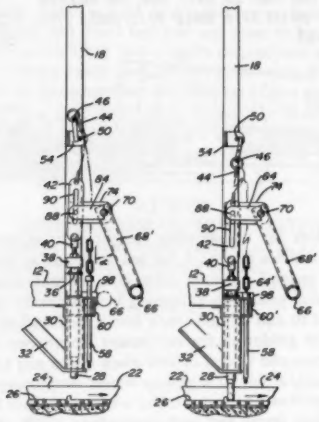
MATERIAL HANDLING VEHICLE

Craig Sleep, Bangor, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Jan. 18, 1978, Ser. No. 870,307
Int. Cl.[2] B61B *10/04*
U.S. Cl. 104—172 BT **9 Claims**

1. In a tow vehicle comprising a body mounted on wheels, a tow pin on said body and movable upwardly from an operative position wherein it can contact a conveyor to an inoperative position wherein it is out of contact with a conveyor, a bumper movably mounted on the body for movement between an extended position and a retracted position, said bumper being coupled to said tow pin for moving said tow pin from its operative position to its inoperative position as said bumper moves to its retracted position, means biasing said bumper to its extended position, means on said body independent of said bumper for elevating the tow pin to an elevation above said inoperative position including a link having an elongated slot, a

member extending transversely through said slot and connected to said bumper, one end of said link is at an elevation above and pivotably connected to the upper end of said tow pin, said elevating means including a handle, said link being connected to said handle by way of a flexible chain or the like,



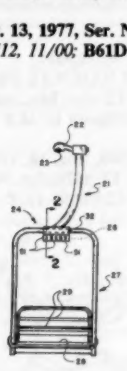
said link being connected to said tow pin so that said member can move the tow pin when it engages an end of said slot, said slot being sufficiently long so that said member remains in said slot in both the operative and inoperative positions of said tow pin and in both the extended and retracted positions of said bumper.

4,179,994

SUSPENDED ARTICULATED CHAIRLIFT MOUNTING ASSEMBLY

Jan K. Kunczynski, Boulder Cove, Box 256, Glenbrook, Nev. 89413

Filed Oct. 13, 1977, Ser. No. 841,813
Int. Cl.[2] B61B *7/12, 11/00;* B61D *33/00;* F16D *3/58*
U.S. Cl. 105—150 **9 Claims**



1. Chair assembly mounting apparatus for movably mounting a chair frame to a hanger arm including, a housing rigidly mounted to at least one of said arm and said frame, a resiliently displaceable rubber-like member positioned inside said housing, said housing and said rubber-like member being shaped for cooperative coupling of said frame to said arm, said housing being further shaped to apply a compressive load to said rubber-like member, and movement resisting means mounted to one of said frame and said arm and formed to displace said rubber-like member upon relative movement of said arm and said frame, wherein the improvement in said chair assembly mounting apparatus comprises:

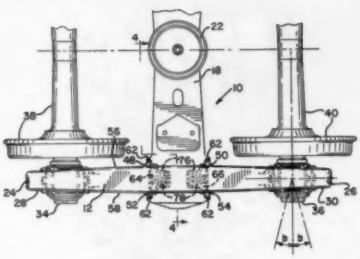
said rubber-like member being formed with a transversely extending opening therein, a portion of one of said arm and said frame being mounted to pass through said opening in said rubber-like member, and said portion being rotatably movable about the longitudinal axis of said opening to cause displacement of said rubber-like member by said movement resisting means in a manner resisting said relative movement.

4,179,995

SNUBBED RAILROAD CAR TRUCK

John C. Day, Hinsdale, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 693,092, Jun. 4, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,027
Int. Cl.[2] B61F *5/12, 5/28, 5/46, 5/50*
U.S. Cl. 105—197 DB **3 Claims**



1. A truck for a railroad car comprising,

a pair of spaced side frames, each said side frame including,

a side frame window in part defined by spaced sidewalls, a top compression member, and a bottom tension member,

vertical ribs formed on an inner and an outer side of each said side frame, said ribs located one each adjacent to said side frame window sidewalls and defined in part by a flat vertical front surface and side surface, and

a pedestal jaw formed at ends of each said side frame, said jaw defined by spaced vertical sidewalls and a roof surface having a laterally concaved configuration,

bearing adapter means disposed one each in said pedestal jaws to receive in a journaled relationship axle ends of wheelsets of said truck respectively, said adapter means having spaced vertical end walls positioned adjacent to and spaced from said pedestal jaw sidewalls sufficient distance to limit relative horizontal rotational movements between said wheelsets and said side frames to a position slightly out-of-square by interengaging contact between said adjacent pedestal jaw end walls and said adapter sidewalls, and a top surface having a convex configuration having a radius less than a radius of said concave roof surface of said pedestal jaw, said top surface of said adapter means and said roof surface of said pedestal jaw joining to form a rollable self-centering joint between said adapter and said side frame,

an elongated bolster positioned transversely to and between said spaced side frames with ends disposed one each in said side frame window and resiliently supported therein by spring means carried by said tension member of said window, each said bolster end including a front and a rear recess having a bolster pocket prepared to receive a snubbing device, offset vertical sidewalls located adjacent to and on each side of said bolster pocket, and opposing convex-shaped end walls, said front and said rear recesses forming a vertical guide for said sidewalls of said side frame window with said ribs engaging with said convex-shaped end walls of said bolster recess to form a rollable joint between said side frame and said bolster, and

snubbing means disposed one each in said bolster pockets to in part maintain said bolster and said side frame in a

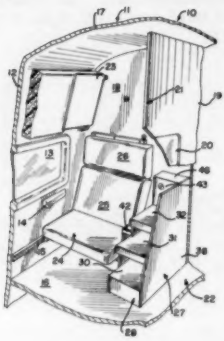
square relationship and to limit yaw movement therebetween.

4,179,996

FIXTURE FOR PASSENGER RAILWAY CAR COMPARTMENT

Jack E. Gutridge, Dyer, and Ronald W. Marsh, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 12, 1977, Ser. No. 859,426
Int. Cl.[2] B61D *1/08, 31/00*
U.S. Cl. 105—345 **8 Claims**



1. For a railway passenger car compartment including a floor, an outer car wall, inner longitudinally spaced partition walls, a divider wall connected to said partition walls, said divider wall extending substantially parallel to rail outer car wall and positioned adjacent to an access aisle,

said compartment including a hinged bed supported on said outer wall,

a convertible seat and passenger bed arrangement adjacent to one of said partition walls, the improvement comprising;

a fixture including a base portion positioned adjacent to said seat and passenger bed and said divider wall,

said base including a first shelf having a lower horizontal surface contiguous with and supported on said floor,

a second shelf, supported on and above said first shelf,

said second shelf having its terminal frontal portion spaced longitudinally inwardly with respect to a frontal portion of said first shelf,

a third shelf supported on said base above said second shelf, said third shelf having a terminal frontal portion spaced longitudinally inwardly with respect to the frontal portion of said second shelf,

an arm rest positioned between said second and third shelves and incorporated within outboard side panel means and adjacent to said convertible seat and passenger bed,

said outboard side panel means including a first outboard side panel connecting outboard side edges of said first and second shelves and said arm rest, and a second outboard side panel connecting an inboard side edge of said arm rest and an outboard side edge of said third shelf,

said first outboard side panel having a first edge portion extending between said first and second shelves and spaced inwardly with respect to the terminal frontal edge portion of said second shelf, said first outboard side panel having a second edge portion extending between said second shelf and said arm rest and spaced inwardly with respect to the terminal frontal edge portion of said third shelf, and

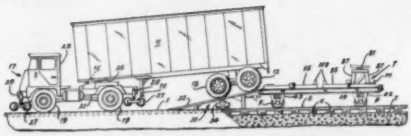
said second outboard side panel having a third edge portion generally vertically aligned with said second edge portion of said first outboard side panel.

4,179,997

RAIL-HIGHWAY INTERMODAL FREIGHT CARRIER TRANSPORT SYSTEM

George B. Kirwan, Huntington, W. Va., assignor to Intermodal Concepts, Inc., Chambersburg, Pa.

Filed Dec. 23, 1977, Ser. No. 863,916
Int. Cl.[2] B61D *3/16;* **B61F** *3/12;* **B65J** *1/02, 1/22*
U.S. Cl. 410—53 **26 Claims**



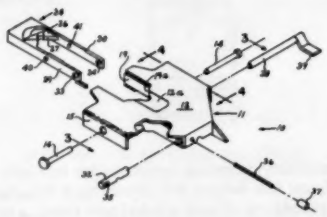
1. In a system for transporting freight carriers including highway semi-trailers by rail, a rail truck having at least two longitudinally spaced wheeled axles and a frame supported thereon, a central guideway extending longitudinally substantially from end to end of said truck frame, pedestal structure mounted in said guideway for movement lengthwise thereof substantially from end to end of said truck frame and supporting a fifth wheel, a pair of highway wheel supporting structures supported in end to end relation with each other lengthwise of said truck frame and each comprising a pair of transversely spaced longitudinally extending treadways spaced apart transversely a sufficient distance to receive said pedestal structure between them and a transverse member connecting the treadways of each wheel supporting structure to each other and extending beneath said longitudinal guideway, whereby to permit movement of said fifth wheel pedestal structure to selective positions alternately abreast of said highway wheel supporting structures and thereby accommodating the selective support of the rear highway wheels of a semi-trailer on either of said highway wheel supporting structures and the support of the front king pin of a second highway semi-trailer by said fifth wheel on the end portion of the truck frame carrying said other highway wheel supporting structure.

4,179,998

HEAD INSERT FOR RAILWAY TRAILER HITCH

Joseph F. Niggemeier, St. Charles, Mo., and Richard P. Yeates, Downers Grove, Ill., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 825,560, Aug. 18, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,313
Int. Cl.[2] B65J *1/22*
U.S. Cl. 410—64 **5 Claims**



1. In a trailer hitch to be mounted upon a railway flat car having a vertical strut and a diagonal strut in extended position supporting a hitch head adapted to engage and hold in place a kingpin of a trailer supported on said flat car, said hitch including a top plate having a given thickness having an opening including a generally semicircular kingpin engagement portion; a pair of movable jaws located below said top plate, a yoke engaging said movable jaws; a spring biasing said yoke and jaws into closed position; said jaws in closed position holding the kingpin captive in said head and adapted to engage said top plate, said kingpin applying horizontal loads to said

kingpin engagement portion in transit, the improvement comprising:

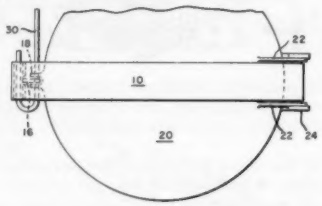
an insert made of wear resistant and crack resistant material mounted on said top plate within said opening and overlying substantially the entire vertical extent of said kingpin engagement portion and the thickness of said insert being at least equal to said given thickness; fastening means engaging said insert and said top plate to hold said insert in place overlying said kingpin engagement portion; said insert being easily and quickly removable from said top plate by disconnecting said fasteners from said top plate, whereby a new insert may be quickly inserted in place within said opening while said hitch remains in place on said flat car without taking said flat car out of service.

4,179,999

HATCH COVER CLOSURE SYSTEM

Soule E. Cotten, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 23, 1978, Ser. No. 889,206
Int. Cl.[2] B61D *39/00*
U.S. Cl. 105—377 **4 Claims**



1. In a hopper car having a hatch housing and a hatch cover which is hinged to the car, a closure device comprising:

a resilient flexible strap having first and second ends,

said first end of strap being hinged to the car at or about same location as the hatch cover is hinged,

a floating link connecting said second end of the strap to the hatch cover, said link allowing for movement between the strap and cover, and

a slide bolt for securing said second end of the strap to the hatch housing, said strap and housing having means for receiving the bolt when the cover is in place and the strap has been stressed

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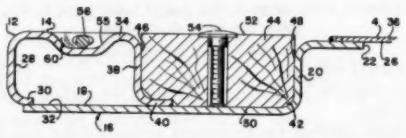
4,180,000

FREIGHT CAR DOOR POST

Richard C. Snyder, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Continuation of Ser. No. 606,822, Aug. 22, 1975, abandoned.
This application Jun. 7, 1977, Ser. No. 804,213
Int. Cl.[2] B61D *19/00*
U.S. Cl. 105—409 **8 Claims**



1. A door post assembly for a freight vehicle having upper and lower sills comprising a hollow metal portion defining a doorway edge and a resilient nailable section disposed in laterally abutting relation to the metal portion,

said metal portion comprising inner and outer vertical members,

said inner member being U-shaped in cross-section and having transverse webs including means slidably seated against a longitudinal wall of the outer member and means securing the upper and lower ends thereof to the upper and lower sills of the vehicle, respectively, and

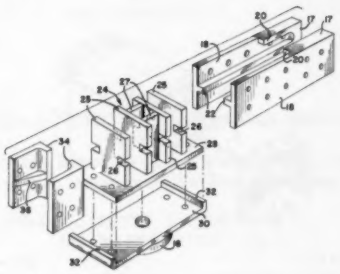
said metal portion being laterally deflectable against said resilient nailable section for yieldably resisting lateral blows directed against said metal section.

4,180,001

CENTER FILLER FOR RAILWAY VEHICLE

George S. McNally, South Holland, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 22, 1977, Ser. No. 863,385
Int. Cl.[2] B61F *1/08, 5/16*
U.S. Cl. 105—420 **6 Claims**



1. In a railway vehicle having an underframe with a draft sill with spaced side webs and spaced flanges with bottom surfaces located on a horizontal plane and said draft sill forming a connection with car body bolsters, the improvement comprising a modular rear draft lug and center filler arrangement including:

draft lug means having extension means adjacent to the side webs and being continuous through the connection between the body bolsters and the draft sill;

connection means on said draft lug means;

means attaching the draft lug means to said side webs;

center filler means with vertically disposed plate means abutting the draft lug means;

said center filler means having means securing said center filler means with said connection means;

said center filler means having a bottom cover plate;

said bottom cover plate having a lower surface disposed in the same horizontal plane with the spaced flanges of the draft sill;

center plate means;

said center plate means having a skirt portion with upwardly extending flange means;

said flange means being spaced apart a first distance to nestle about the bottom cover plate; and

means attaching said skirt portion to said bottom cover plate.

4,180,002

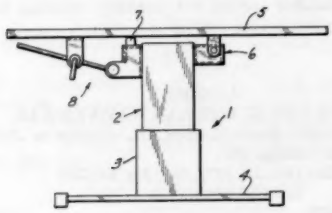
TILTABLE TABLE

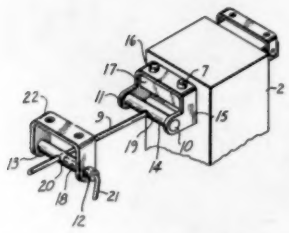
David F. Huempfner, Kewaunee, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 12, 1978, Ser. No. 923,843
Int. Cl.[2] A47F *5/12;* **A61G** *13/00*
U.S. Cl. 108—6 **13 Claims**

1. A tiltable table with a top pivotally mounted to a base and having laterally spaced side edges, wherein the improvement comprises: a tilt lock mechanism that includes at least two laterally spaced pivot joints on the base; at least two laterally spaced pivot joints on the top; a connecting arm located approximately midway between the top's side edges and joined to the pivot joints; and a manipulable locking structure that simul-

taneously locks the connecting arm and laterally spaced pivot joints to rigidify the top, with the lateral distance between each





pair of pivot joints being substantially greater than the width of at least a portion of the connecting arm.

4,180,003

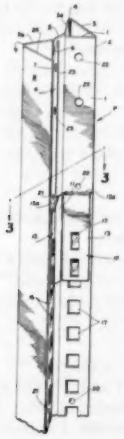
SHELF SUPPORT STRUCTURE

Joseph J. Clement, Bradenton, Fla., assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 685,519, May 12, 1976. This application Nov. 14, 1977, Ser. No. 851,447

Int. Cl.[2] A47B *9/00*

U.S. Cl. 108—144 **6 Claims**



1. In a shelf support assembly, a shelf support post of unitary construction comprising web structure, a pair of generally parallel flange panels secured along corresponding edges to opposite edges of said web structure respectively, a pair of support strips secured respectively along corresponding side edges to the edges of said flange panels remote from said web structure and disposed at acute angles with respect to said flange panels respectively, and the portion of said web structure remote from said flange panels being disposed in close proximity to said support strips.

4,180,004

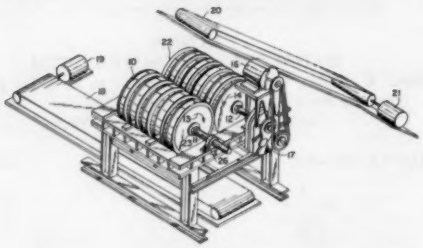
METHODS OF HANDLING WASTE INCLUDING RUBBER TIRES

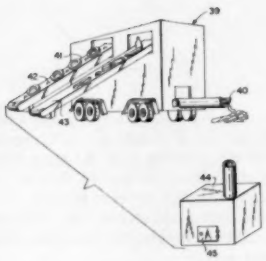
Albert O. Johnson, Livingston, Tex., assignor to Tire-Gator, Inc., Houston, Tex.

Division of Ser. No. 770,002, Feb. 18, 1977. This application Mar. 1, 1978, Ser. No. 882,449

Int. Cl.[2] F23G *7/00*

U.S. Cl. 110—346 **8 Claims**





1. The process of reducing the volume to ash and disposal of bulk household or industrial waste garbage and trash including the steps of shredding simultaneously a mixture of rubber tires and diverse kinds of combustible materials, and incinerating said shredded mixture to convert the bulk waste to ash.

4,180,005

TILLER PLANTER WITH MODIFIED SOIL LEVELING AND PULVERIZING UNIT

Vincent J. Zumbahlen, R.R. #3, Newton, Ill. 62448

Continuation-in-part of Ser. No. 647,655, Jan. 8, 1976, Pat. No. 4,048,929. This application Sep. 19, 1977, Ser. No. 834,756

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] A01C *5/00, 5/08*

U.S. Cl. 111—52 **17 Claims**

1. A machine for tilling and planting the surface of a field comprising:

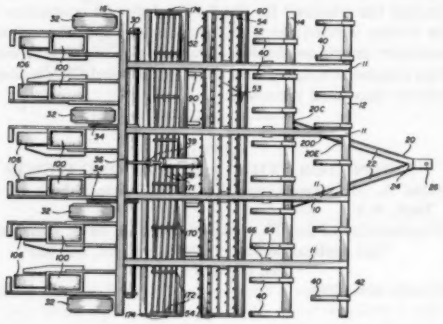
a frame adapted for movement across a field, said frame adapted to be drawn by a prime mover tractor, the longitudinal attitude of said frame being adjustable from said tractor, whereby the operator of said tractor can independently adjust both the elevation of the front of said frame and the elevation of the rear of said frame;

a plow unit mounted below the forward portion of said frame, said plow unit comprising a plurality of chisel plows adapted to plow the soil as said frame is moved through the field;

a soil leveling and pulverizing unit flexibly mounted below

said frame, to the rear of said plow unit, said soil leveling and pulverizing unit extending substantially the width of said plow unit, adapted to level and pulverize the soil, said soil leveling and pulverizing unit being biased downwardly but being limited as to downward movement and as to depth of soil penetration;

a seed bed finishing implement flexibly mounted below said frame to the rear of said soil leveling and pulverizing unit,



said seed bed finishing implement extending substantially the width of said plow unit, and adapted to finish the soil to prepare a seed bed as said frame is pulled through the field; and

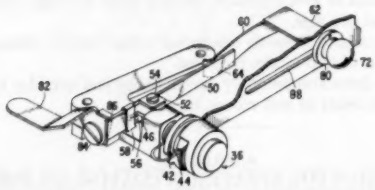
a seed planting unit rigidly mounted on the rear of said main frame whereby the seed planting unit is raised from the ground when the rear of the main frame is elevated, said seed planting unit adapted to plant a plurality of rows of seeds as said frame is pulled through the field.

4,180,006

TENSION SELECTING MECHANISM FOR SEWING MACHINES

Roger J. Ross, Mont St-Gregoire, Canada, assignor to The Singer Company, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,066
Int. Cl.[2] D05B *47/02*
U.S. Cl. 112—254 **1 Claim**



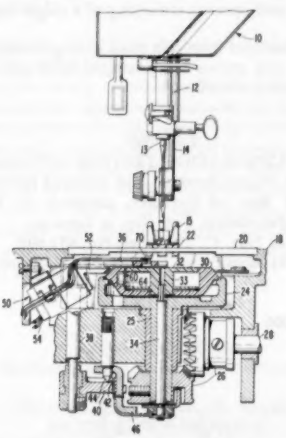
1. An improved tension selecting mechanism for a sewing machine having a frame including a work supporting bed and a hollow upwardly open bracket arm overhanging said bed, an arm top cover to enclose said open bracket arm having a horizontal slot formed therein, an endwise reciprocating thread-carrying needle, a needle thread tension device including a first thread engaging disc and a second thread engaging disc carried on a supporting stud for applying frictional resistance to the movement of a needle thread between said first and said second discs, an axially shiftable rod for moving said first thread engaging disc toward and away from said second thread engaging disc, a lever having a supporting fulcrum and a free end, means on said lever spaced from said fulcrum for engaging said axially shiftable rod, leaf spring supported relatively to said sewing machine frame and having a contact point formed at one end thereof to impart a spring bias to a location along said lever between said free end and said fulcrum to apply a tension to said axially shiftable rod, wherein the improvement comprises an operator influenced clamp means for adjusting the point of contact between said lever and said leaf spring, said clamp means including a stud projecting from said leaf spring through said slot in said arm top cover, said stud being substantially perpendicular to the axis of said lever, means associated with said stud for frictionally resisting movement thereof along said slot, and a selecting knob on said stud slidably carried exteriorly of said arm top cover for slidably varying the point of contact between said lever and said leaf spring.

4,180,007

ELECTROMAGNETIC BOBBIN THREAD SUPPLY ALARM

Wesley R. Peterson, Bound Brook, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,340
Int. Cl.[2] D05B *45/00*
U.S. Cl. 112—278 **3 Claims**



1. A locksmith sewing machine having a looptaker; a bobbin case supported in said looptaker against motion therewith; a lower thread carrying bobbin carried by said bobbin case, said bobbin having a hub supporting a pair of thread retaining flanges; and an arm overhanging said looptaker, bobbin case and bobbin with a portion thereof adjacent said hub of said bobbin; wherein the improvement comprises:

a sensor supported in said portion of said arm adjacent said hub of said bobbin;

a lever pivoted on said bobbin case for rotation between said flanges of said bobbin to said hub thereof, said lever having a pivoted end and a free end and carrying a stimulus for said sensor arranged thereon increasingly to stimulate said sensor as said free end of said pivoted lever approaches said hub;

means for yieldingly urging said lever alternately toward and away from said hub of said bobbin; and,

means responsive to a certain level of stimulation of said sensor for providing an indication of the approach of said free end of said lever to said hub and, thereby, of impending exhausting of bobbin thread.

4,180,008
SOLDERLESS BELL AND METHOD OF FORMING A SOLDERLESS BELL

Kisaburo Nakamoto, 5-8, 1-chome, Matsue, Atsugi-shi, Kanagawa-ken, Japan

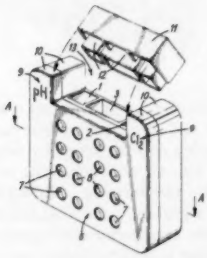
Filed Jul. 24, 1978, Ser. No. 927,604
Int. Cl.[2] G10K *1/06;* B21D *28/00*
U.S. Cl. 116—170 27 Claims

12. A seamless, solderless bell comprising:
(a) a container formed by stamping a blank of metal;
(b) a clapper located within said container;
(c) a single sound opening located at the bottom of said container; said opening consisting of a single longitudinal slit; and
(d) a crown stamped from said blank arranged on top of said container, said crown being integral with said container and protruding therefrom.

4,180,009
ION CONCENTRATION TESTING APPARATUS

Cay-Peter Voss, Hagen-Berchum, and Manfred Nowak, Lunen, both of Fed. Rep. of Germany, assignors to Tintometer GmbH, Westfalendamm, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,603
Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723723
Int. Cl.[2] G01N *31/22*
U.S. Cl. 116—206 1 Claim

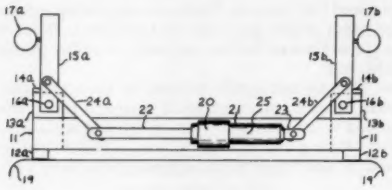


1. A device for simultaneously determining both the ph value and Cl_2 ion concentration of swimming pool water by admixture therewith of color forming reagents, said device comprising a casing formed with a row of three adjacent, transparent containers for separately receiving pool water, said containers spaced from the top of said casing, a first and second of said containers being for receiving reagents to produce color reactions respectively relating to the ph value and Cl_2 ion concentration of the pool water in the containers, the third container being a reference container free of color forming reagents, said containers having a common wall, and a fixed indicating screen situated in juxtaposition with the common wall, said screen having a plurality of differently tinted windows distributed over the height of the casing and aligned with the reference container, and a corresponding plurality of transparent windows aligned with the first and second containers, a lid for closing said containers, said lid including three adjacent downwardly projecting, transparent cap portions which fit into and seal said three adjacent containers when the casing is manually agitated to facilitate dissolving of the reagents, said lid fitting flush with the top of the casing when in closed position whereby said comparison of the colors viewed through the windows for the first and second containers with the colors viewed through the windows for the reference container, enable an absolute determination of color formation from reagent action and thus the ph values and Cl_2 ion concentrations associated therewith.

4,180,010
MOUNT FOR VEHICULAR WARNING LIGHTS

Julian A. McDermott, and Kevin McDermott, both of New York, N.Y.

Continuation of Ser. No. 641,908, Dec. 18, 1975, abandoned.
This application Jan. 9, 1978, Ser. No. 867,951
Int. Cl.[2] B60Q *7/00*
U.S. Cl. 116—209 8 Claims



1. In combination,
a mounting frame for mounting on a roof of a vehicle;
a pair of light mount bars, each said bar being pivotally mounted at an end thereof to said mounting frame;
an actuator for pivoting said mount bars between a horizontal position and a vertical position relative to said frame, said actuator having a body, a motion element mounted in said body for relative linear motion to one side of said body, and an arm connected to said body on a side opposite said one side;
a first force arm pivotally connected to said motion element and one of said mount bars; and
a second force arm pivotally connected to said actuator arm and the other of said mount bars.

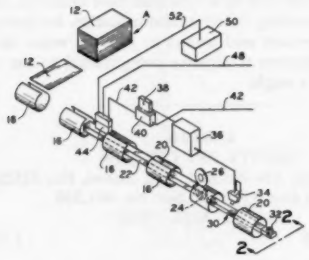
4,180,011
APPARATUS FOR SPRAYING A COATING ON THE INSIDE SURFACES OF LONGITUDINAL SEAMS ON CAN BODIES

Frank E. Halicki, Oak Lawn, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sep. 12, 1977, Ser. No. 832,528
Int. Cl.[2] B05C *7/02*
U.S. Cl. 118—685 6 Claims

1. Apparatus for spraying a coating on the inside surfaces of longitudinal seams on can bodies or the like, said apparatus comprising: an elongated arm having a longitudinal axis and a terminal end portion; means for moving longitudinally seamed can bodies along said arm longitudinally with the longitudinal seams spaced vertically above said arm; an air spray nozzle of the type to which air and liquid coating material are separately supplied and the coating material is atomized and projected from the nozzle by the air; said air spray nozzle being mounted on said terminal end portion of said arm in a position for spraying a coating material vertically upwardly in a direction ex-

tending perpendicular to said longitudinal axis of said arm and radially of the longitudinal axis of the can bodies for applying a uniform layer of coating material against the inside surfaces of longitudinal seams on can bodies moving past said nozzle and minimizing overspray, splattering and dripping of the coating material; a needle valve carried by said arm for movement between open and closed positions for selectively starting and stopping flow of coating material to said nozzle; an air



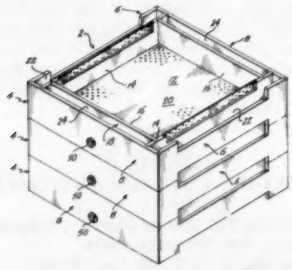
operated actuator for moving said needle valve between said open and closed positions independently of air supplied to said nozzle for atomizing the coating material; and, air supply means for supplying air to said actuator at a pressure greater than the pressure of the air supplied to said nozzle for providing rapid operation of said needle valve while maintaining relatively low pressure air spraying of the coating material to minimize splattering and overspray.

4,180,012

FISH EGG INCUBATOR WITH FRY RELEASE MEANS

Harold H. Zenger, Sr., P.O. Box 713, Juneau, Ak. 99802

Filed Dec. 12, 1977, Ser. No. 846,908
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **16 Claims**



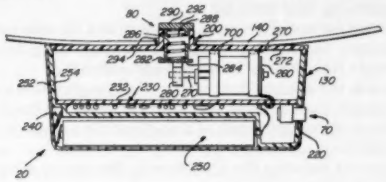
13. A fish egg incubator comprising a stack of relatively spaced liquid containers, each having an open-topped recess therein for the liquid and a quadrilateral frame in the recess which is spaced inwardly from the periphery of the recess on all sides thereof and defines a central basin for the container, there being a pair of inflow chambers formed in the recess on the opposite ends of the frame and a pair of outflow chambers formed in the recess on the opposite sides of the frame, said inflow chambers communicating with the basin through entry ports formed between the bottom of the container and the frame and said basin having a false bottom therein to support the fish eggs at a level below the top of the frame so that the fry are contained in the basin when the eggs hatch, said false bottom being apertured and forming a plenum therebelow which interconnects the ports with the basin so that when incubation liquid is introduced to the inflow chambers of the relatively upper container, to a level commensurate with the top of the frame on the aforesaid opposing sides thereof, the liquid flows downward through the ports, into the plenum and thence upwardly into the basin through the apertures in the false bottom thereof, and thereafter weirs over the tops of the aforesaid opposing sides of the frame into the outflow chambers of the relatively upper container, there being outlets in the outflow chambers to discharge the liquid therefrom and a pair of spigot-like conduit means connected with the outlets and depending from the relatively upper container independently of the bottom thereof and in the space between the containers to deliver the discharged liquid to points vertically above the inflow chambers of the relatively lower container so that the liquid is transmitted downward through the stack in the same pattern of flow from one container to the next.

4,180,013

ANIMAL BEHAVIORAL CONTROL DEVICE

Thomas M. Smith, 3445 Wadsworth Blvd., #7, Wheat Ridge, Colo. 80033

Filed Nov. 14, 1977, Ser. No. 851,517
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—29 **10 Claims**



1. A device for controlling the behavior of an animal, said device further comprising:

means in said device releasably connectable to said animal for generating a signal in response to the start of a predetermined pattern of sound emitted by said animal, and

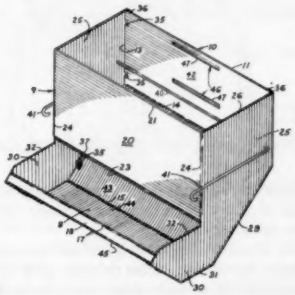
means releasably connectable around the neck of said animal operative only upon receipt of said signal for applying mechanical vibration to the area of said animal neck nearest to the vocal cords of said animal, said vibration being of sufficient intensity and duration to cause said animal to swallow and to cause the dog to be incapable of completing the emitted sound.

4,180,014

ANIMAL FEEDER

Donald C. Mathews, Rte. 1, Box 32 F, Newman Lake, Wash. 99025

Filed Jul. 11, 1977, Ser. No. 814,484
Int. Cl.[2] A01K *5/01, 39/014*
U.S. Cl. 119—52 R **6 Claims**



4. A feeder for animals, comprising:

an upwardly open feeding trough defined by a bottom wall having transverse front and rear edges, an upright front wall joined to the bottom wall along said front edge, and parallel

side walls each having a lower projecting portion joining said bottom wall and front wall, the lower projecting portions of the side walls and the upright front wall terminating along open edges located in a common lower plane, bounding a feeding area across the trough;

an upwardly open storage hopper in communication with the trough, the hopper being defined by an upright hopper front wall leading downwardly to the rear of the feeding trough and terminating along an open bottom edge slightly above said common plane bounding the feeding trough and spaced from the bottom wall, a rearwardly spaced upright back wall having a lower transverse edge, and transverse inclined wall leading downwardly and forwardly from the lower transverse edge of the back wall to the rear edge of the bottom wall;

said upright front wall, upright back wall and inclined wall being joined to said side walls at the respective side edges thereof;

said upright front wall, upright back wall and side walls defining open upper edges along a common upper plane, for receiving feed material;

wherein the upright hopper front wall and the side walls of the hopper and feeding trough are integral, being formed of a single first sheet of bendable stiff material;

wherein the upright front wall of the trough, the bottom wall, upright back wall of the hopper and the inclined wall are integral, being formed of a single second sheet of bendable stiff material; and

means for securing the first sheet to the second sheet to form the hopper and feeding trough.

4,180,015

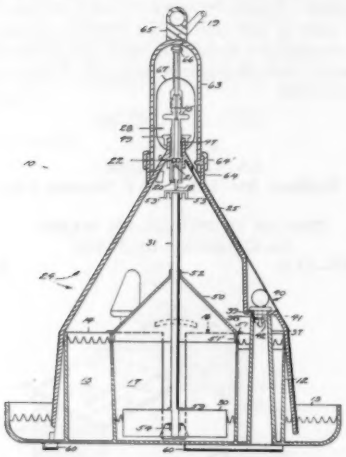
FAIL SAFE SUSPENSION POULTRY DRINKER

Carl B. Dawson, Jr., 1637 Handley Ave., Winchester, Va. 22601

Filed Mar. 23, 1978, Ser. No. 889,504

Int. Cl.[2] A01K *7/04*

U.S. Cl. 119—78 **12 Claims**



1. A suspension or floor supported poultry drinker comprising a base member including an annular drinking trough around the periphery thereof,

said base member comprising means providing ballast to minimize movement of the drinker, said ballast providing means defining a water reservoir and said base member further comprising means defining a float chamber, said float chamber concentric with said annular trough, and said reservoir generally concentric with said float chamber and said trough;

a valve,

means for connecting said valve to a source of water,

means for supporting said valve so that said valve is in water communication with said reservoir;

a float disposed in said float chamber,

a float rod operatively connected to said float and extending from said float upwardly toward said valve,

means for providing communication between a top portion of said reservoir and said float chamber so that after water from said valve reaches a predetermined level in said reservoir it will overflow into said float chamber, and

means for providing water communication between said float chamber and said trough so that the water level in said float chamber is directly proportional to the water level in said trough.

4,180,016

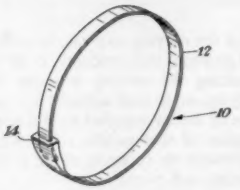
SAFETY PET COLLAR

William M. George, 550 Brickell Ave., Miami, Fla. 33129

Filed Dec. 19, 1977, Ser. No. 861,533

Int. Cl.[2] A01K *27/00*

U.S. Cl. 119—106 **2 Claims**



1. An improved safety flea collar for a domestic animal, comprising:

an elongated flexible strip having a pesticide embedded therein for killing fleas, ticks and the like, said strip having an end with a hollow chamber and an opposite free end, said end hollow chamber having a predetermined depth and being sized and shaped to be substantially the same size, contour and cross-section as said free end of said collar, said free end being insertable into said end hollow chamber, said free end when inserted in said end hollow chamber a selected depth to provide for, a predetermined frictional force for resisting disengagement of said free end and said chamber end.

4,180,017

PIPE ASSEMBLY-HEAT EXCHANGER-STEAM DRUM UNIT

Witold Drobka, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,333

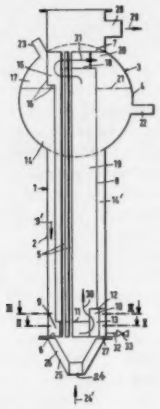
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1977, 2735064

Int. Cl.[2] F22B *1/06, 37/26*

U.S. Cl. 122—34 **9 Claims**

1. A pipe assembly heat exchanger-steam drum unit for a heat exchanger between media of relatively high differential pressure, which includes: a steam drum comprising a liquid receiving space with an inlet for liquid under pressure and also comprising a steam receiving space located above said liquid receiving space and provided with an outlet for releasing steam from said steam receiving space, a pipe-assembly-heat exchanger having inlet means and outlet means and having a first relatively thin bottom at one end and a second relatively thin bottom at its other end, said heat exchanger comprising pipes extending in the form of a nest of pipes transversely and substantially centrally through said steam drum and having one end located remote from said drum and connected to said first bottom while communicating with said inlet means for admitting a hot medium therethrough into said pipes, said pipes having another end connected to said second bottom while communicating with said outlet means for releasing said last

mentioned medium after it has passed through said steam drum, said pipe assembly heat exchanger and said steam drum forming a unit with each other, and jacket means comprising a



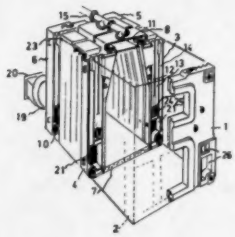
first mantle section surrounding said pipes from said steam drum to said first thin bottom and also comprising a second mantle section forming the outer wall of said steam drum and having a surface portion facing away from said inlet means.

4,180,018

HEATING BOILER

Bruno Larsson; Kurt Bohm; Janeric Strom, and Borje Aslund, all of Norrahammar, Sweden, assignors to Parca Norrahammar AB, Sweden

Filed Sep. 21, 1977, Ser. No. 835,308
Claims priority, application Sweden, Sep. 29, 1976, 7610772
Int. Cl.[2] F22B *25/00*
U.S. Cl. 122—225 R **8 Claims**



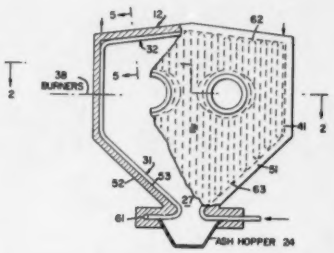
1. A boiler having a roof portion, a front wall, a rear wall, side walls, and a collecting duct extending in the longitudinal direction of the boiler, said front, rear, and side walls defining a combustion chamber; said side walls comprising alternating water chamber portions and convection portions; each of said convection portions comprising at least two vertical cylindrical substantially parallel flues, each having an inlet and an outlet, connected serially thereby providing upward or downward passages for flue gases, the inlet of the first being open to the combustion chamber and the outlet of the last being connected to said collecting duct; said at least two vertical flues of each convection portion being arranged in one transverse cross-sectional plane of the boiler; and the inlet to each flue having a tangential direction to the wall of the flue, substantially perpendicular to the longitudinal direction of the flue.

4,180,019

PROCESS HEATER

Thomas F. O'Sullivan, Montclair, N.J., and William H. Pollock, East Granby, Conn., assignors to The Lummus Company, Bloomfield, N.J.

Filed Mar. 1, 1978, Ser. No. 882,544
Int. Cl.[2] F22B *21/24*
U.S. Cl. 122—235 N **12 Claims**



1. A process heater, comprising:

a housing having walls, a roof and an ash receiving hopper bottom, said housing defining a front radiant section and a rear convection section, said housing walls in the radiant section including a downwardly and inwardly sloping bottom portion defining an elongated throat therebetween in communication with the ash receiving hopper;

a plurality of closely spaced vertically extending tubes arranged in a single row against the walls of the radiant section and co-extensive therewith a portion of the vertically extending tubes in the radiant section including bent portions to conform to the configuration of said downwardly and inwardly sloping bottom wall portion to provide a fluid cooled bottom for ash removal;

a plurality of closely spaced horizontally extending process tubes arranged in a single row against the roof of the radiant section and coextensive therewith, said horizontal tubes extending across the radiant section between the housing walls, vertical and horizontal tubes in the radiant section being interconnected to provide at least one process fluid coil having at least two fluid passes in the radiant section;

each vertical tube against the walls of the radiant section and each horizontal tube against the roof of the radiant section including fins covering the spaces between adjacent horizontal and vertical tubes to provide a fin tube wall construction covering the walls of the radiant section including the downwardly and inwardly sloping bottom, and covering the roof of the radiant section, said fin tube wall construction preventing build-up of ash behind the tubes;

a plurality of vertical convection tubes positioned in the convection section; and

at least one ash containing fuel fired burner in the front of the housing to heat process fluid.

4,180,020

PULSE SMOOTHING CIRCUIT FOR AN ELECTRONIC FUEL CONTROL SYSTEM

Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

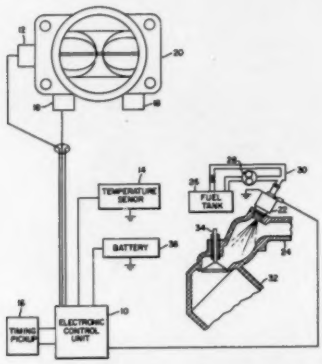
Filed Sep. 26, 1973, Ser. No. 400,996
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **8 Claims**

1. In a power producing engine fuel control system of the type driven by the voltage from a system voltage supply source and having sensor means responsive to engine conditions operative to provide signals indicative of engine operating parameters one of which is applied as a reference signal, including means responsive to engine triggering events, for providing accurately timed electrical signals for delivering

metered quantities of fuel to the engine, the improvement comprising:

means connected to the system supply source for sensing the level of the voltage therefrom;

means connected to the system and to the voltage level sensing means for adjusting the level of the reference



signal when the supply voltage is below a predetermined level to prevent regeneration of the fuel delivery signals; and

switching means for switching the reference signal level adjusting means in and out of the system as a function of the supply voltage and without interfering with the operation of the system.

4,180,021

METHOD OF INJECTING FUEL AND A FUEL INJECTION DEVICE OF AN INTERNAL COMBUSTION ENGINE

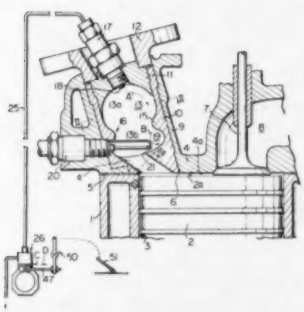
Hiromichi Yanagihara, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 20, 1977, Ser. No. 799,098

Claims priority, application Japan, Mar. 28, 1977, 52-33309

Int. Cl.[2] F02B *19/10*; F02F *3/28*

U.S. Cl. 123—32 ST **3 Claims**



1. A fuel injection device in an internal combustion engine comprising a main chamber, an auxiliary chamber having an axis and consisting of a first chamber and a second chamber, a connecting passage communicating said second chamber with said main chamber and being tangentially connected to an inner wall of said second chamber for creating a swirl motion of a suction gas in said auxiliary chamber at the time of the compression stroke, said second chamber having a recess at a position located opposite to said inner wall to which said connecting passage is tangentially connected with respect to the axis of said auxiliary chamber, a fuel injector in the end of said first chamber most remote from said second chamber for directing a rich air-fuel mixture toward said recess, and a spark plug having a spark gap located in the vicinity of said recess for igniting said rich air-fuel mixture, said fuel injection device comprising:

a housing having a cylinder bore;

a plunger reciprocally movable in said cylinder bore and having a pair of grooves extending along a circumferential wall of said plunger and spaced from each other for forming an inner circumferential wall for the plunger operation having a predetermined shape between said grooves;

a fuel feed port opening into said cylinder bore and arranged to cooperate with said inner circumferential wall for the plunger operation when said plunger moves upwards;

a fuel delivery port opening into said cylinder bore and connected to said fuel injector; and

a plunger actuating means for rotating said plunger about its axis in accordance with the level of the load of said engine, said inner circumferential wall for the plunger operation closing said fuel feed port for starting the injecting operation when said plunger moves upwards from a lowermost position thereof to reach a predetermined first position and when said level of the load of said engine is higher than a predetermined level, while said inner circumferential wall for the plunger operations opens said fuel feed port for stopping said injecting operation when said plunger moves upwards from said lowermost position to reach a predetermined second position which is higher than said predetermined first position and when said level of the load of said engine is lower than said predetermined level.

4,180,022

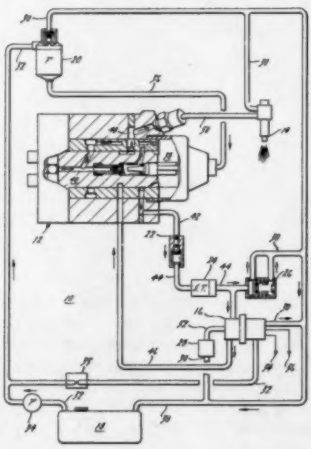
FUEL INJECTION SYSTEM AND CONTROL VALVE FOR MULTI-CYLINDER ENGINES

Magdi K. Khair, Birmingham, and Jay C. McCombie, West Bloomfield, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1977, Ser. No. 846,755

Int. Cl.[2] F02B *3/00*; F02M *39/00*

U.S. Cl. 123—32 AE **4 Claims**



1. In a fuel injection system a control valve adapted to control fuel flow to an injector mechanism comprising;

a valve body;

an inlet, outlet and drain port in said body, said outlet being connected to said injector mechanism, said inlet being connected to a source of high pressure fuel and said drain port being connected to a fuel reservoir;

a first fluid passage within said body between said inlet and said outlet;

a second fluid passage within said body connecting said outlet to said drain port;

a valving element disposed in said first passage to control flow therethrough, said valving element having a first and second position, said valving element blocking fluid flow through said first passage in said first position and blocking fluid flow through said second passage in said second position;

an electro expansive actuator disposed in said valve body for said valving element to move said valving element from said first to said second position;

an annular space in said valve body surrounding said actuator; and

a second inlet connected to a source of low pressure fuel and a second outlet connected to a return line to said fuel reservoir said low pressure fuel flowing continuously into and out of said annular space to maintain the electro-expansive actuator near ambient temperature and prevent the actuator's stroke from changing during operation.

4,180,023

ELECTRONICALLY-CONTROLLED FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING ODD NUMBERS OF CYLINDERS

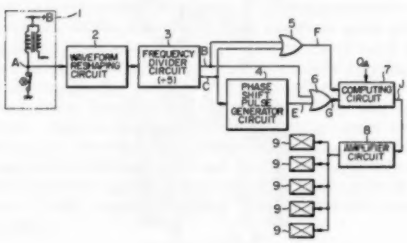
Akio Kobayashi, Kariya; Kunio Endo, Anjo, and Norio Omori, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 25, 1978, Ser. No. 927,820

Claims priority, application Japan, Jul. 29, 1977, 52/91540

Int. Cl.² F02B 5/00

U.S. Cl. 123—32 EA **5 Claims**



1. An electronically-controlled fuel injection system for an internal combustion engine having odd numbers of cylinders, in which the quantity of fuel supplied to the engine cylinders is regulated by the duration of pulses of a fuel injection pulse signal applied to solenoid-operated fuel injection valves, and two fuel injection pulses are generated in each operating cycle of the engine, said system comprising:

a waveform reshaping circuit for reshaping the waveform of an ignition signal supplied from an ignition unit for the engine;

a frequency divider circuit connected to said waveform reshaping circuit for dividing the frequency of the output pulse signal of said waveform reshaping circuit by the number of cylinders of the engine thereby generating a first and a second pulse signals, the phase of each pulse in said second pulse signal lagging behind that of the corresponding pulse in said first pulse signal by n ignition pulse intervals where n is a multiple of the half of the number obtained by subtracting unity from the number of cylinders of the engine;

a phase shift pulse generator circuit connected to said frequency divider circuit for generating a third pulse signal in which the terminating or fall time of each pulse is delayed relative to that of the corresponding pulse in said second pulse signal by the half of one ignition pulse interval; and

computing means connected to said frequency divider circuit and said phase shift pulse generator circuit for generating the fuel injection pulse signal including a train of pulses each appearing in response to the termination of the corresponding pulses in said first and third pulse signals, said fuel injection pulse signal being applied to said solenoid-operated fuel injection valves which inject fuel into the cylinders of the engine.

4,180,024

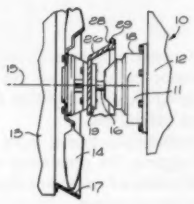
INTERNAL COMBUSTION ENGINE FAN ADAPTER

Fredrico Hernandez, P.O. Box 1376, Palmdale, Calif. 93550

Filed Jun. 28, 1978, Ser. No. 919,965

Int. Cl.² F01P 5/12

U.S. Cl. 123—41.46 **12 Claims**



1. An adapter for attaching a radiator cooling fan to a water pump of an internal combustion engine for rotation therewith about an axis, comprising:

an adapter body having a rear wall to be connected to a flange of said water pump and having a front wall spaced forwardly of the rear wall and to which said fan is connectable;

said rear wall containing openings spaced circularly about said axis for reception of bolts securing the body to said water pump flange;

said body containing a rearwardly opening central pilot recess into which a pilot projection carried by said water pump flange projects in centering relation;

said front wall having a forwardly projecting centering boss receivable in centering relation within an opening in the fan;

said body containing a plurality of circularly spaced wrench receiving recesses which extend radially inwardly thereinto between said front and rear walls and are defined at their front and rear sides by said walls and into which a wrench can extend to engage and turn heads of said bolts securing said rear wall to the water pump flange;

said body forming a plurality of circularly spaced partitions which extend radially outwardly between said wrench receiving recesses and separate them one from another and which rigidly connect said front and rear walls together at circularly spaced locations.

4,180,025

FUEL INJECTION SYSTEM

Ulrich Steinbrenner, Stuttgart; Dieter Kirn, Asperg, and Hans Schnürle, Walheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 8, 1977, Ser. No. 766,639

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605059

Int. Cl.² F02B 3/00

U.S. Cl. 123—32 EA **21 Claims**

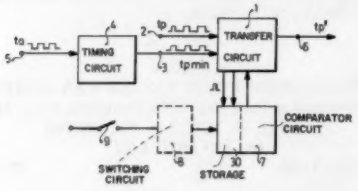
1. A fuel injection system for an internal combustion engine, comprising, in combination:

electromagnetic fuel injection valves associated with combustion cylinders of the engine;

means for generating primary fuel injection valve control pulses from trigger signals related to engine rpm and from signals related to the aspirated air flow rate;

storage means for storing electrical values related to engine data;

comparator circuit means for generating comparison pulses from said stored electrical values;



transfer circuit means, connected to accept information from said comparator circuit means for providing selective passage of said fuel injection valve control pulses to said fuel injection valves; and

timer means including a timing input circuit, actuated by rpm-related signals, for generating secondary fuel injection control pulses of minimum duration for passage to said transfer circuit means.

4,180,026

APPARATUS FOR CONTROLLING THE OPERATING CURRENT OF ELECTROMAGNETIC DEVICES

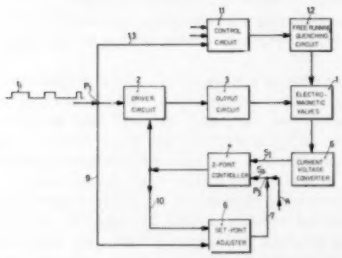
Peter Schülzke, Oberriexingen; Herbert Arnold, Eberdingen; Klaus Harsch, Ditzingen, and Peter Werner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 781,808

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612914; Feb. 16, 1977, 2706436

Int. Cl.[2] **F02M** *51/00;* **H01F** *7/18*

U.S. Cl. 123—32 EF **35 Claims**



1. In an apparatus for controlling solely the actuation current supplied to an electrical device, in particular to one or more electromagnetic fuel injection valves having actuating coils which respond to fuel injection control pulses supplied by the fuel injection system of an internal combustion engine, the duration of said pulses being dependent substantially on engine air throughput and engine speed (rpm) and said duration of said pulses determining the amount of fuel admitted by said valves, said apparatus including positive and negative power supply lines;

an output circuit connected to the actuating coils of the fuel injection valves for providing actuation of said fuel injection valves, said output circuit having a fully conducting or a fully turned off state, said output circuit including:

a feedback-controlled driver and logic circuit for receiving said fuel injection control pulses from said fuel injection system; and

sensing means for sensing the actual magnitude of the actuation current in the actuating coils of said injection valves and for generating a control variable as a function thereof, the improvement comprising:

a feedback circuit including: a two-point controller circuit connected to said driver and logic circuit and to said sensing means for receiving the control variable from said sensing means; and a set-point switching circuit for receiving trigger pulses coincident with said fuel injection control pulses, said set-point switching circuit being connected to said two-point controller circuit for providing an increased set-point signal to said two-point controller circuit at the beginning of each fuel injection control phase, said two-point controller circuit serving to render said output circuit either fully conducting, at least when the beginning of a fuel injection control pulse is received by the feedback-controlled driver and logic circuit, or fully turned-off.

4,180,027

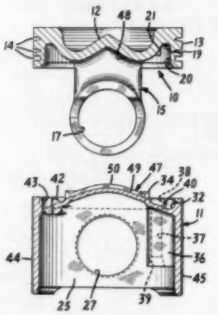
TWO-PIECE OIL-COOLED PISTON

Joe N. Taylor, Mercersburg, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Jul. 20, 1977, Ser. No. 817,348

Int. Cl.[2] **F01P** *3/06, 3/10*

U.S. Cl. 123—41.35 **22 Claims**



1. A two-piece piston comprising:

a one-piece integral head section having a crown and depending boss means, said boss means having a bore for receiving a pin, and the head section being formed with an annular undercrown recess adjacent the periphery of the crown; and

a one-piece integral skirt section for assembly with the head section, the skirt section having bores corresponding to and coaxial with the bore in the head section when the head and skirt sections are assembled together, and having an annular coolant-carrying tray in opposed spaced relation to the undercrown recess of the head section, so as to form a coolant chamber substantially continuous about the periphery of the piston when the head and skirt sections are assembled together, the tray having an inner wall portion extending toward and spaced from the undercrown surface of the head section to provide a passage for controlling the flow of coolant exiting said tray toward the center portion of said undercrown surface; and

said skirt section being formed with at least one passage communicating with the tray for introducing coolant under force into said tray from a reservoir disposed beneath said piston.

4,180,028

FLUID OPERATED DEVICE

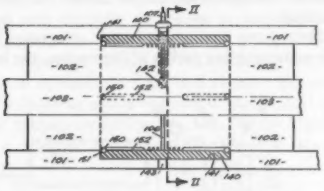
Paul A. Richter, 1 Hammersley Pl., Fisher, Australia

Filed Jul. 9, 1976, Ser. No. 703,984

Claims priority, application Australia, Jul. 11, 1975, 2333; Nov. 7, 1975, 3883; Jan. 14, 1976, 10299

Int. Cl.[2] F02B 53/06; F01L 7/04

U.S. Cl. 123—45 A 10 Claims



1. A fluid operated device comprising: a cylinder member, at least two mutually opposed piston members movable axially therein, a common working chamber within said cylinder member defined by opposing ends of said piston members and the inner wall of said cylinder member, said cylinder member being provided with inlet means and outlet means communicating with said working chamber for admission of working fluid to said chamber and for removal of spent working fluid from said chamber, respectively; a shaft member extending through said piston members and said cylinder member concentrically with said members, first coupling means coupling the piston members to one of the other mentioned members such that axial reciprocation of the piston members causes rotation of the piston members relative to said one of the other mentioned members; second coupling means coupling the piston members to the other one of the other mentioned members to prevent relative rotation of the piston members and said other one of the other mechanical members while permitting axial reciprocation of the piston members; and valve means in said working chamber operatively coaxially coupled to said shaft member for rotation with said shaft member relative to the cylinder member, said valve means comprising a substantially cylindrical ring member having an aperture therein which, on rotation of said valve means, selectively communicates with said inlet means and said outlet means in said cylindrical member to control movement of working fluid into and out of said working chamber through said inlet and outlet means.

4,180,029

2-CYCLE ENGINE OF AN ACTIVE THERMOATMOSPHERE COMBUSTION

Sigeru Onishi, Kanazawa, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1977, Ser. No. 861,947

Claims priority, application Japan, Dec. 29, 1976, 51-158047; Oct. 11, 1977, 52-120895

Int. Cl.[2] F02B 25/20

U.S. Cl. 123—73 A 35 Claims

1. A method of combustion in a 2-cycle engine having a crank room, a combustion chamber and a scavenging passage communicating the crank room with the combustion chamber, said method comprising the steps of:

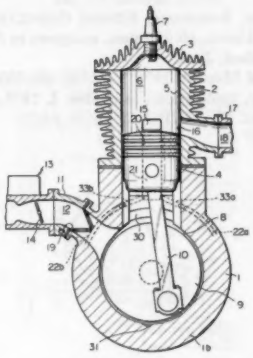
introducing a fresh combustible mixture into the crank room;

leading the fresh combustible mixture in the crank room into the scavenging passage;

flowing the fresh combustible mixture from the crank room at a first high speed for a long time in a first substantially long section of the scavenging passage remote from the combustion chamber for promoting the vaporization of the liquid fuel contained in the fresh combustible mixture;

flowing the fresh combustible mixture at a second speed slower than the first speed in a second section of the scavenging passage downstream of the first section and substantially shorter than it;

feeding the fresh combustible mixture from the second section into the combustion chamber at at most the lower speed while suppressing the flow and turbulence of the burned gas in the combustion chamber and preventing the dissipation of the heat of the burned gas in the combustion



chamber for maintaining the residual burned gas in the combustion chamber at a high temperature;

creating an active thermoatmosphere in the combustion chamber at the beginning of the compression stroke;

continuing to maintain the active thermoatmosphere until the end of the compression stroke, and reforming the fresh combustible mixture; and

causing self-ignition of the fresh combustible mixture.

4,180,030

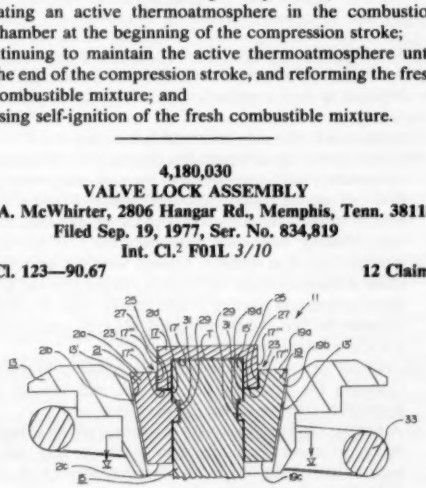
VALVE LOCK ASSEMBLY

John A. McWhirter, 2806 Hangar Rd., Memphis, Tenn. 38118

Filed Sep. 19, 1977, Ser. No. 834,819

Int. Cl.[2] F01L 3/10

U.S. Cl. 123—90.67 12 Claims



1. A valve lock means for locking a valve spring retainer having an inner wall to the distal end of a valve stem in a valve assembly of the type including a cup-shaped lash cap for placement over the tip of said distal end of said valve stem, said lash cap having a substantially larger outside diameter than the largest outside diameter of said distal end of said valve stem, said valve lock means comprising: wedged-shaped means, having an enlarged cavity-like portion at the upper end of said wedge-shaped means and having inner walls extending downwardly from said cavity-like portion over a major portion of the length of said wedge-shaped means adjacent said valve stem, for being wedged between said valve spring retainer and said valve stem to lock said valve spring retainer and said valve stem together and for receiving a portion of said lash cap in said enlarged cavity-like portion, said valve lock means extending above said inner wall of said valve spring retainer, and said enlarged cavity-like portion extending outwardly beyond

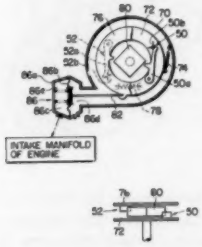
and being substantially larger than said inner walls of said wedge-shaped means.

4,180,031

METHOD AND SYSTEM FOR CONTROLLING IGNITION SPARK TIMING OF AN INTERNAL COMBUSTION ENGINE OF THE MULTIPLE PLUGS TYPE

Shigeo Muranaka, Yokohama; Kōkichi Ochiai, Fujisawa, and Makio Waku, Urawa, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 13, 1976, Ser. No. 686,083
Claims priority, application Japan, Jul. 2, 1975, 50-81540
Int. Cl.[2] F02P *7/00, 5/10, 15/02*
U.S. Cl. 123—117 A **7 Claims**



1. In an ignition timing control system for an internal combustion engine of the type wherein first and second spark plugs are disposed in each combustion chamber, the improvement comprising:

a breaker cam rotatably mounted in a casing;

first and second signal generators disposed in the casing and cooperating with and operable by said braker cam, said first and second signal generators being electrically connected to the first and second spark plugs, respectively, and including means for generating the first and second ignition signals at different timings with a predetermined phase difference when the positions of the first and second signal generators relative to said breaker cam are changed to cause the first and second spark plugs to ignite with the predetermined phase difference;

adjustment means for varying said phase difference by changing the positions of said first and second signal generators relative to said breaker cam; and

an actuating device operatively connected to the adjustment means to move the adjustment means in response to a suction prevailing in an induction passsage of an engine carburetor of a throttle valve.

4,180,032

DEVICE FOR THE REGULATION OF THE TEMPERATURE OF A SUPERCHARGED DIESEL ENGINE

Alain E. Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Feb. 8, 1977, Ser. No. 766,794
Claims priority, application France, Feb. 10, 1976, 76 03646
Int. Cl.[2] F02B *33/44*
U.S. Cl. 123—119 CD **10 Claims**

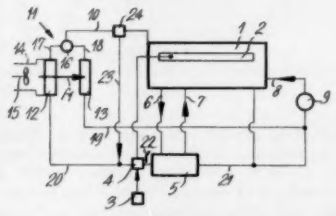
1. A system for regulating the temperature of a supercharged diesel engine having parts lubricated by oil, a water cooling jacket having an input and an output, and a supercharging air supply, the system comprising:

a first water heat exchanging circuit having one input connected to the output of the water cooling jacket of the engine;

a second water heat exchanging circuit having one input connected to the output of the water cooling jacket of the engine;

a heat exchanging assembly comprising an air heat exchanging circuit means for cooling the supercharging air supply of the engine and an oil cooling heat exchanger means for cooling the oil lubricating the parts of the engine, said air heat exchanger means being connected to said oil cooling heat exchanger, and said heat exchanging assembly having one input connect to the output of said first heat exchanging circuit;

a circulation pump having one output connected to the input of the water cooling jacket of the engine, the input of said



circulation pump being connected both to the output of the second heat exchanging circuit and to the output of said heat exchanging assembly;

a by-pass circuit means connected to the output of said water cooling jacket of the engine and to the input of said heat exchanging assembly for causing the water flowing from the water cooling jacket to bypass said first and second water heat exchanging circuits; and

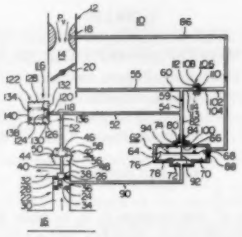
a valve, said valve being sensitive to the temperature of the water coming from the water cooling jacket of the engine and provided to control the actuation of said by-pass circuit.

4,180,033

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sep. 2, 1977, Ser. No. 830,343
Claims priority, application Japan, Sep. 3, 1976, 51-105972
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**



1. An exhaust gas recirculation (EGR) control system in combination with an intake combustion engine including

an intake passageway **14** providing communication between the atmosphere and the engine and having

a venturi **18** formed therein; and

an exhaust gas passageway providing communication between the engine and the atmosphere, said EGR control system **10**, **142**, **166** comprising

an EGR passageway **22** providing communication between the exhaust gas passageway and the intake passageway for recirculating thereinto exhaust gas emitted from the engine, said EGR passageway having provided therein

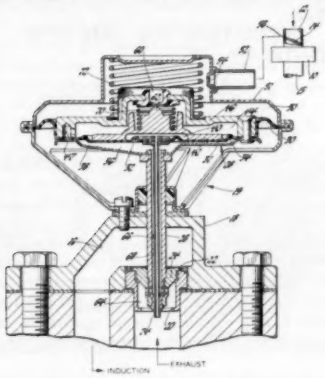
a restriction **24, 34** for restricting said EGR passageway;
an EGR control valve **38** which is disposed in said EGR passageway downstream of said restriction to define a first chamber **28** interposed between said restriction and said EGR control valve and is operable in opposite directions to increase and reduce the pressure of engine exhaust gas in said first chamber for controlling the flow of recirculated engine exhaust gas; and
an operating device **42, 62** for operating said EGR control valve in said opposite directions in accordance with a working pressure,
a pressure adjusting device **62** for adjusting said working pressure in accordance with said exhaust gas pressure in said first chamber and a vacuum in the venturi, and
an altitude correction device **116, 144, 168** for adjusting said working pressure in accordance with the atmospheric pressure.

4,180,034

EXHAUST GAS RECIRCULATION CONTROL

William A. Vogelsberg, Yale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 25, 1978, Ser. No. 909,547
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **10 Claims**



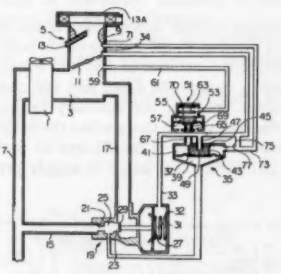
1. An exhaust gas recirculation control assembly for an engine having an induction passage for induction air flow and a recirculation passage for exhaust gas recirculation to said induction passage, said assembly comprising a control valve in said recirculation passage, an orifice in said recirculation passage upstream of said valve, and means for positioning said valve to provide exhaust gas recirculation at rates which maintain the control pressure in said passage between said orifice and said valve equal to a reference pressure, and wherein the improvement comprises means for varying said reference pressure inversely with the backpressure in said recirculation passage upstream of said orifice, whereby said control pressure is varied inversely with said backpressure and exhaust gas recirculation is provided as a proportion of induction air flow which varies directly with induction air flow.

4,180,035

INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS RECIRCULATION SYSTEM

Junichi Saiki, Susono, and Teruo Kumai, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 23, 1978, Ser. No. 918,380
Claims priority, application Japan, Apr. 25, 1978, 53-48324
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **5 Claims**



1. An internal combustion engine with exhaust gas recirculation system comprising:
a valve device for controlling the exhaust gas recirculation which communicates an exhaust passage of said engine with an intake passage of said engine and which is provided with a diaphragm chamber, partitioned by a diaphragm, and a constant pressure chamber, partitioned by a valve body which is actuated by said diaphragm;
a modulator valve device for modulating a vacuum signal which is transmitted from a first port disposed at a position upstream of a throttle valve of a carburetor to said diaphragm chamber, said modulator valve device is provided with an upper diaphragm chamber, which is communicated with a second port disposed at a position nearer to a venturi portion of said carburetor than said first port, and a lower diaphragm chamber, which is communicated with said constant pressure chamber of said exhaust gas recirculation control valve device;
a vacuum control valve device for controlling the vacuum pressure in said upper diaphragm chamber of said modulator valve device in accordance with changes in intake vacuum of said engine, said vacuum control valve device is provided with an upper chamber, which is partitioned by a diaphragm and communicated with said intake passage of said engine, and a lower chamber, which is communicated with said upper diaphragm chamber of said modulator valve device and which has an opening for discharging vacuum therefrom formed on the wall thereof, and;
an orifice which communicates a first communicating pipe, which communicates said first port with said diaphragm chamber of said exhaust gas recirculation valve device, with another communicating pipe, which is communicated with a port disposed upstream of said first port.

4,180,036

FUEL TEMPERATURE CONTROL

Gil Wolf, 7412 Laramie, Skokie, Ill. 60076

Filed Jan. 23, 1978, Ser. No. 871,242
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 E **3 Claims**

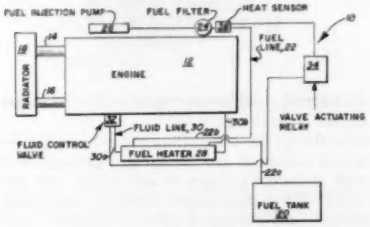
1. In a preheating system for liquid diesel fuel being used in a diesel engine, such as for use in an automotive vehicle equipped with a liquid cooled engine and having radiator means for dissipating excess engine heat from the heated liquid coolant, wherein the preheating system includes heat exchanger means for transferring heat from liquid coolant to

diesel fuel that is being acted upon by a pump for effecting pressurized injection of liquid diesel fuel through injector means into the engine;

the improvement comprising, in combination:

a heat exchanger means including a liquid tight casing enclosing and partially bounding a flow space for diesel fuel, heat transfer tube means occupying a portion of the entire space enclosed by the casing and for carrying therethrough liquid coolant after the engine has been started and is running, and a selectively energizable auxiliary heating element positioned in said flow space for the diesel fuel;

means including a pump downstream of the heat exchanger means for causing diesel fuel to move only through said flow space that is exterior of said heat transfer tube means in the casing, so that the diesel fuel will contact, in direct heat transfer relation, the auxiliary heating element to preheat the fuel at such times when the temperature of the engine coolant liquid is insufficient to preheat the fuel, thereby permitting said pump to supply preheated liquid



diesel fuel to the engine to permit engine start-up at very low temperatures;

flow line means arranged for directing heated liquid coolant from the engine through the heat transfer tube means of the heat exchanger means after the engine has been started and after the selectively energizable heating element has been de-energized;

temperature sensing means for sensing the temperature of heated liquid diesel fuel being delivered downstream of the heat exchanger means to said downstream pump for injecting heated diesel fuel into the engine;

shut-off valve means operatively controlled by said temperature sensing means for either permitting, or shutting off, flow of liquid coolant from the engine to said heat transfer tube means; and

said temperature sensing means being operative to limit heating of the diesel fuel by heat transferred from said heated liquid coolant when the temperature of the heated liquid diesel fuel sensed exceeds about 180° F., so as to prevent scorching of the fuel injector means by heated liquid diesel fuel.

4,180,037

INJECTION PUMP CONTROL SYSTEM

Nobuhito Hobo, Inuyama; Yutaka Suzuki, Nishio; Takashi Naito, and Yoshimune Konishi, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 27, 1977, Ser. No. 846,018

Claims priority, application Japan, Dec. 26, 1976, 51-157278

Int. Cl.² F02M *63/02*

U.S. Cl. 123—139 E **3 Claims**

1. An injection pump control system comprising:

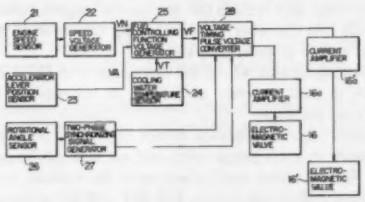
an injector pump rotor;

a plurality of mutually independent pressure feed means disposed in said rotor, each of said pressure feed means including at least a pair of inner cams and a pair of pump plungers;

a separate fuel inlet passage means provided for each of said pressure feed means;

an electromagnetic valve disposed in each of said fuel inlet passage means to open and close the same; and

an electric control circuit adapted for making the number of open-close operations of each electromagnetic valve equal



to the number of operations of each pressure feed means and for controlling the duration of opening of each electromagnetic valve in accordance with the operating conditions of an engine.

4,180,038

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

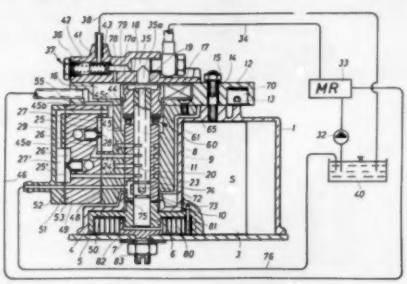
Johannes Steinwart, Obersulm-Willsbach; Gerhard Maurhoff; Armin Bauder, both of Neckarsulm; Gottlieb Wilmers, Neuenstadt, and Reiner Pischke, Jagstfeld, all of Fed. Rep. of Germany, assignors to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,948

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703722

Int. Cl.² F02M *39/00;* **B01D** *47/00*

U.S. Cl. 123—139 AW **13 Claims**

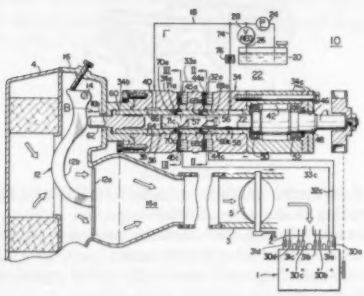


1. A fuel injection system for a mixture-compressing internal-combustion engine with separate ignition and continuous fuel injection into the inlet duct, which incorporates an adjustable throttle butterfly valve and a baffle flap pivotally mounted at the side of the inlet duct to move in accordance with the air flow rate acting in opposition to a return force, the baffle flap being coupled to a damper blade and to a coaxial rotary control member of a fuel metering valve, comprising a control cylinder containing a relatively rotatable control piston arranged to meter the quantity of fuel delivered to one or more injection nozzles in proportion to the air flow rate, the control cylinder being stationary and mounted alongside the baffle flap outside the inlet duct, and the rotary control piston being connected outside the control cylinder adjacent one end to the baffle flap, and adjacent the other end to the damper blade, so as to rotate with the flap and the blade.

4,180,039
FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 8, 1978, Ser. No. 903,658
Claims priority, application Japan, May 12, 1977, 52-54686
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 AW **7 Claims**



1. A fuel injection system for an internal combustion engine, comprising:

a plurality of sets of fuel injectors adapted to be mounted on the engine;

each of the fuel injectors of each set being associated with one of the engine cylinders so that each engine cylinder is provided with a plurality of injectors equal in number to the fuel injector sets;

a fuel source operative to supply a fuel under a predetermined pressure to said fuel injectors;

means for metering the fuel from said fuel source and distributing the metered fuel to said fuel injectors;

said fuel metering and distributing means including a housing defining therein a fuel inlet port connected to said fuel source and a plurality of sets of fuel outlet ports each connected to one of said fuel injectors;

the fuel outlet port sets being equal in number to said fuel injector sets;

said fuel metering and distributing means further including a rotor and means defining a plurality of sets of apertures;

the apertures of each set being equal in number to the engine cylinders;

the aperture sets being equal in number to said fuel outlet sets and thus to said fuel injector sets;

said rotor being mounted in said housing for rotation in timed relationship to the engine operation and defining a plurality of orifices equal in number to said aperture sets and operatively associated respectively with said aperture sets;

one of said rotor and said aperture defining means being disposed inside the other and defining a fuel passage always in communication with said fuel inlet port in said housing;

each of said apertures being substantially aligned with one of said fuel outlet ports;

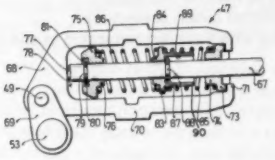
the rotation of said rotor moving said orifices relative to said apertures in the circumferential direction of said rotor so that at least one of said orifices is brought into overlapping and communicating relationship with successive apertures of the corresponding set to allow the fuel to flow from said fuel passages through the overlapped and communicated orifice and apertures to the associated fuel outlet ports and thus to the associated fuel injectors;

means responsive to variation in the rate of engine intake air flow to cause relative movement between said aperture defining means and said rotor so that relative movement between said rotor and said sets of apertures is caused axially of said rotor, the arrangement being such that the number of the orifices brought into overlapping and communicating relationship to the apertures is increased to increase the fuel supply to respective cylinders as the engine intake air flow rate is increased, and vice versa.

4,180,040
REGULATOR FOR A FUEL INJECTION PUMP

Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg; Manfred Schwarz, Gerlingen, and Helmut Laufer, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,885
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612940
Int. Cl.² F02D *1/06*; F02M *39/00*; F04B *49/00*
U.S. Cl. 123—140 R **11 Claims**



1. In an r.p.m. regulator of a fuel injection pump for internal combustion engines, including a fuel supply quantity setting member, a control spring mechanism having a preloaded control spring, a control lever connected to the control spring mechanism and to the fuel supply quantity setting member for actuating said fuel supply quantity setting member, said control lever being pivotably mounted between its connected ends, a setting lever, said control spring mechanism being connected to said setting lever and to said control lever thereby applying the preload of said control spring to said control lever, and an r.p.m.-dependent force applying means engaging said control lever between its ends for applying thereto an r.p.m.-dependent force in opposition to the force exerted by said control spring, a first connecting member connected to said setting lever, a second connecting member connected to said control lever, both said connecting members being part of said control spring mechanism, the improvement comprising:

tandem springs axially aligned between said first and second connecting members and excursion limiting means interposed between at least two of said springs.

4,180,041
INTERNAL COMBUSTION ENGINE WITH INTAKE ARRANGEMENT TO PRODUCE SWIRL IN COMBUSTION CHAMBER

Hiroaki Miyazaki, Kamakura; Yasuo Sakai, Yokohama, and Tosimitu Matuoka, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 3, 1977, Ser. No. 774,038
Claims priority, application Japan, Mar. 5, 1976, 51-23154
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **14 Claims**

1. An internal combustion engine comprising:

a cylinder with a cylinder axis;

a piston reciprocably slidable within said cylinder;

means defining an intake passageway having an intake port passage having an upstream end, with respect to the flow of a combustible charge passing through said intake port passage, and a downstream end opening to said cylinder, said downstream end of said intake port passage being positioned within a plane having an unit vector which is normal to said plane and has its origin placed at the middle

of said downstream end, directed toward said piston and an area disposed in proximity of said cylinder axis; and

swirl means for causing the combustible charge passing through said intake passageway to swirl in said cylinder, said swirl means having a first flow restrictor means for restricting and directing and deflecting flow of the combustible charge passing through said intake passageway to urge the combustible charge to enter said cylinder in substantially a tangent direction to the cylinder wall;

said first restrictor means being disposed on that one of the two opposed inner wall portions of said intake passageway that is positioned nearer to said cylinder axis than the other wall portion;

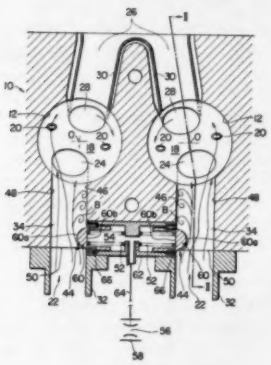
said first flow restrictor means protruding into said intake passage within an area disposed in the proximity of said upstream end of said intake port passage;

said swirl means comprising:

control means whereby said first flow restrictor means varies the effective flow area of said flow restrictor means in response to load on the engine;

and said control means comprising:

a carburetor with a venturi connected to said intake passageway;



a spring means yieldably biasing said first flow restrictor means in a direction in a sense to reduce the effective flow area of said first flow restrictor means; and

chamber means communicating with said venturi for urging, against the bias action of said spring means, said first flow restrictor means in the opposite direction in a sense to increase the effective flow area of said first flow restrictor means in response to vacuum at said venturi.

13. In an internal combustion engine the method of introducing air into a cylinder of the engine comprising the steps of:

introducing air into an intake passageway leading to said cylinder so that said air undergoes substantially laminar flow in said passageway;

projecting a projection into said passageway at a location upstream of said cylinder thus causing turbulent flow in the air flowing downstream and in the shadow of said projection;

deflecting the portion of the air downstream of said projection which is undergoing laminar flow by using said projection and said air undergoing laminar flow, into said cylinder in a direction substantially tangential with respect to the cylinder wall, so that all of the air in said cylinder swirls therein.

4,180,042

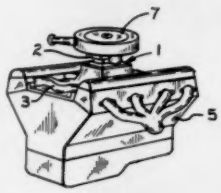
FUEL-AIR MIXTURE REGULATOR FOR INTERNAL COMBUSTION ENGINES

David J. Lloyd, P.O. Box 1016, Blythe, Calif. 92225

Filed May 8, 1978, Ser. No. 903,881

Int. Cl.[2] F02M *29/00*

U.S. Cl. 123—141 **7 Claims**



1. In a four-cycle, multiple cylinder internal combustion engine including intake valves for the respective cylinders and an intake manifold having walls defining passages respectively extending from individual cylinder intake ports to a central passage communicating with the outlet of a carburetor, a fuel-air mixture regulator therefor comprising:

(a) a housing mounted between said carburetor and said manifold central passage, said housing having an inlet end communicating with said carburetor outlet and including walls extended into said central passage and spaced inwardly from said manifold walls;

(b) a plurality of elongate ports in said walls; and

(c) a plurality of thin, elongate resilient reeds having one end secured to said walls adjacent a respective port and extending in overlying relation to said port, said reeds respectively having free ends variably movable away from said ports in response to differential pressures to open said ports and permit fuel-air mixture to flow therethrough and through said intake manifold, said reeds variably opening said ports during engine operation with the opening being less with less differential pressure to provide higher velocity between the reeds and the ports for fuel-air mixture drawn through said carburetor and said housing directed to the intake manifold passages for flow to respective cylinders.

4,180,043

CODE LOCK TYPE ENGINE CONTROL SYSTEM

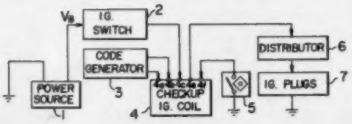
Michio Kawamura, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 2, 1977, Ser. No. 802,864

Claims priority, application Japan, Jul. 1, 1976, 51-78571

Int. Cl.[2] B60R *25/04*

U.S. Cl. 123—146.5 B **4 Claims**



1. An engine control system having an input code checkup function comprising:

an electric power source;

electric actuating means coupled with an engine and available for rotating said engine during the energization thereof by said electric power source;

control means connected to said electric actuating means for generating a control signal in response to which said electric actuating means is allowed to be energized; and

checkup means integrally packaged within said control

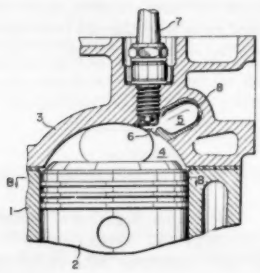
means for comparing an input code signal with a predetermined constant code signal, said checkup means allowing said control means to generate said control signal only when said input code signal is detected to be identical with said constant code signal, said checkup means including a register for temporarily memorizing said input code signal upon each application thereof, a memory for constantly memorizing said constant code signal, and an identity detector, connected to said register and said memory, for generating an output signal when said input code signal is detected to be identical with said constant code signal, said output signal allowing said control means to generate said control signal.

4,180,044

TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE

Shougo Sanda, Okazaki; Noriniko Nakamura, Mishima, and Toshio Tanahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 864,013, Dec. 23, 1977, abandoned, which is a continuation of Ser. No. 689,128, May 24, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 931,293
Claims priority, application Japan, Nov. 10, 1975, 50-134133
Int. Cl.[2] F02B *19/16*
U.S. Cl. 123—191 S **3 Claims**



1. A torch ignition internal combustion engine of the type which has an auxiliary combustion chamber having a single opening which connects said auxiliary combustion chamber with a main combustion chamber, said engine comprising:

a cylinder;

a cylinder head;

a reciprocable piston in said cylinder, said piston having an end face;

said main combustion chamber defined between said cylinder head and the end face of said piston and equipped with intake and exhaust valves;

said auxiliary combustion chamber located in the cylinder head;

a passage directly fluidly interconnecting said main and auxiliary combustion chambers, said passage progressively increasing in transverse cross-sectional area in a direction from adjacent the auxiliary combustion chamber, where the passage is of smallest transverse cross-sectional area and of a ratio within the range of 0.009:1 to 0.023:1 with respect to the cross-sectional area of said end face of said piston; and

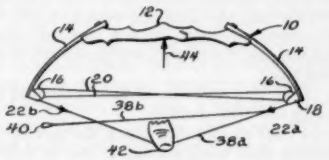
an ignition plug having sparking electrodes located in said passage in a region beyond that of smallest transverse cross-sectional area in a direction towards said main combustion chamber.

4,180,045

COMPOUND BOW STRINGING

Charles E. Kingsley, Evanston, Ill., assignor to Arens Controls, Inc., Evanston, Ill.

Filed May 11, 1978, Ser. No. 904,908
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—90 **5 Claims**



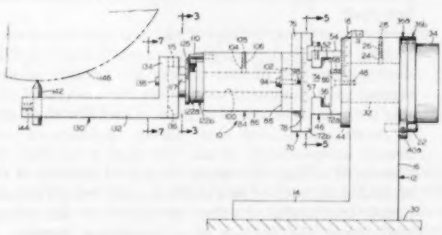
1. Structure for use in a compound bow of the type having cable means having spaced apart free ends, comprising an anchor on each of said free ends having a pair of like bow string receiving portions thereon for tensioning a bow string therebetween, there being a bow string of predetermined length and having anchor receiving loop portions adjacent opposite ends thereof tensioned between anchors and each anchor receiving loop portion being received on only one of each pair of bow string receiving portions, each of said anchors comprising an elongated body portion secured to a respective free cable end and having a longitudinal axis substantially in axial alignment with the adjacent portion of a respective cable, each bow string receiving portion having a narrow neck joined to said body and extending transversely thereof, and a bow string retainer joined to said neck and substantially coextensive therewith in the direction of said longitudinal axis, each said retainer substantially throughout its length being wider than the neck to which it is joined, each said retainer, neck and body forming a generally longitudinally extending channel-like recess to receive a bow string loop.

4,180,046

RADIUS AND ANGLE DRESSER

Ronald E. Kerner, 57 Grove St., Plainville, Conn. 06062

Continuation-in-part of Ser. No. 671,304, Mar. 29, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,987
Int. Cl.[2] B24B *53/06*
U.S. Cl. 125—11 A **11 Claims**



1. A radius and angle dresser comprising:

A. A support member having a first cylindrical aperture extending therethrough;

B. a first shaft on said support member;

C. first mounting means on said first shaft mounting said first shaft in said first aperture for rotation, without axial movement, relative to said support member;

D. first shaft locking means operatively connected between said first shaft and said support member to selectively limit rotation of said first shaft from no rotation to limited rotary oscillation relative to said support member;

E. a mounting member secured to an end of said first shaft for rotation therewith about the axis of rotation of said

first shaft and having a linear track extending perpendicularly to said axis of rotation of said first shaft;

F. a slide member slidably mounted on said track for linear movement along said track perpendicularly of said axis of rotation of said first shaft;

G. means for limiting movement of said slide member along said track;

H. a slide block having a second cylindrical aperture extending therethrough and slidably mounted on said slide member for linear movement thereon perpendicularly to the longitudinal axis of said track and to said axis of rotation of said first shaft;

I. means for locking said slide block in a selected fixed position along said slide member;

J. a second shaft on said slide block, the axis of rotation of said second shaft being parallel to that of said first shaft and perpendicular to the longitudinal axis of said track;

K. second mounting means on said second shaft mounting said second shaft in said second aperture for rotation about the longitudinal axis of said second shaft, without axial movement, relative to said slide block, said second shaft being oscillatable in said second aperture independently of movement of said first shaft;

L. second shaft locking means operatively connected between said second shaft and said slide block to selectively limit rotation of said second shaft from no rotation to limited rotary oscillation relative to said slide block;

M. a tool support member mounted adjacent an end of said second shaft for movement perpendicularly to said axis of rotation of said second shaft;

N. means for locking said tool support member in a fixed position on said second shaft;

O. cutting tool mounting means on said tool support member for mounting a cutting tool to provide a cutting edge thereof angularly disposed relative to the axes of rotation of said shafts; and

P. means for oscillating said first shaft within said support member without effecting axial movement thereof to oscillate the entire subassembly supported thereon about its axis of rotation, said cutting tool support member being oscillatable on said second shaft about the axis of said second shaft independently of oscillation of said first shaft; said tool support member being moveable on said second shaft to move the cutting edge of the associated cutting tool between extreme positions on opposite sides of the axis of rotation of said second shaft, and said slide block being slidable on said slide member to move the cutting edge of the associated cutting tool between extreme positions on opposite sides of said axis of rotation of said first shaft;

whereby appropriate settings of said first and second shaft locking means may be employed to rotate said first shaft during operation of said dresser for rotation of said second shaft therewith to oscillate the associated cutting tool about the axis of rotation of said first shaft, and to rotate said second shaft during operation of said dresser independently of said first shaft to oscillate the associated cutting tool about the axis of rotation of the second shaft, each of said shafts thereby being independently oscillatable to effect oscillation of the cutting tool across the surface of a workpiece rotating in contact therewith.

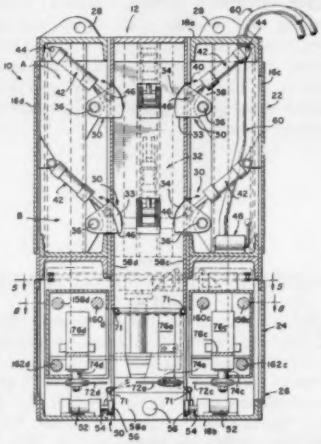
4,180,047

ABOVE AND BELOW WATER AND LAND PILE CUTTING APPARATUS AND METHOD

George H. Bertelson, R.D. 2, Box 112, Neshanic Station, N.J. 08853

Filed Jul. 6, 1978, Ser. No. 922,378
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—14 **10 Claims**

1. A pile cutting machine comprising a main frame said main frame being quadrangular in transverse cross-section and shaped to receive the pile to be cut in a passage extending through the center of the frame, a plurality of extensible pile-gripping clamp means carried by the upper portion of the main frame, a plurality of extensible pile gripping clamp means carried by the lower portion of the frame, a plurality of circular saw assemblies mounted between the upper and lower



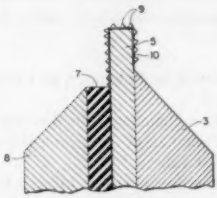
clamp means with the axis of rotation of each saw parallel to the axis of the pile to be cut, a carriage for each saw, means mounting each carriage for reciprocation in a plane normal to the axis of rotation of each saw assembly, means for swinging each saw toward and away from the pile to be cut and further means for reciprocating each saw carriage.

4,180,048

CUTTING WHEEL

Barrie F. Regan, 2260 Redington Rd., Hillsborough, Calif. 94010

Filed Jun. 12, 1978, Ser. No. 914,627
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—15 **1 Claim**



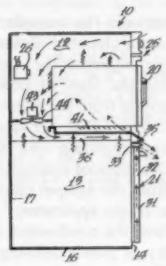
1. In a cutting blade for use in cutting siliceous materials consisting essentially of an electroformed matrix of abrasive particles in a nickel binder, having a blade thickness in the range about 0.0005 to 0.01 inch, having abrasive particles ranging in diameter from 4 to 30 microns and having a surface such that from 40 to 60 percent of the diameter of the exterior abrasive particles protrude from the surface of the nickel matrix, the improvement which comprises a thin layer of electrochemically deposited chromium on the surface of the nickel matrix ranging in thickness from 1/5 to 1/50 the diameter of the abrasive particles.

4,180,049

OVEN ASSEMBLY AIR CIRCULATION SYSTEM

Keith E. Carr, and Vance A. Kimball, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 9, 1978, Ser. No. 867,831
Int. Cl.[2] F24C 15/32
U.S. Cl. 126—21 A 19 Claims



1. In an oven structure having an upper oven defining a bottom, a rear, and a front, and a lower oven disposed subjacent said upper oven bottom and having a rear, a top, and and front, improved means for directing cooling air through said oven structure comprising:

air moving means; and

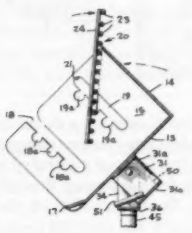
wall means defining a passage spaced below the bottom of said upper oven and open to the top of said lower oven and having an inlet at the rear of at least one of said ovens and an outlet at the front of at least one of said ovens, said air moving means being arranged to flow oven cooling air firstly in heat transfer association with the bottom of said upper oven and then to said inlet for flow through said passage for cooling said top of the lower oven.

4,180,050

OUTDOOR COOKING GRILL UNIT WITH TILTING FEATURE

Guy D. Sizemore, Pickaway, W. Va. 24964

Filed Oct. 21, 1977, Ser. No. 844,490
Int. Cl.[2] A47J 37/07; F24B 3/00
U.S. Cl. 126—25 A 6 Claims



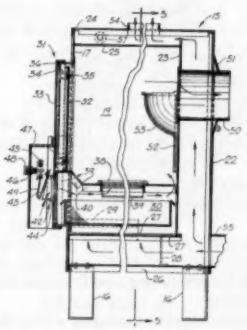
1. An outdoor cooking grill for charcoal cooking and the like, comprising a generally rectangular fire box having a normally generally horizontal rectangular bottom wall and a pair of vertical parallel end walls and a vertical rear wall joined together to define an upwardly and forwardly opening fire chamber, the pair of end walls each having a front slot and a rear slot extending generally vertically along parallel axes from near the bottom of the associated end wall toward the top thereof, the front slot of each end wall extending through the top edge of the end wall in upwardly opening relation and the rear slot in each end wall terminating below the top of the end wall whereby the rear slot is closed at its top, a grating member having a generally rectangular grid portion of spaced parallel rods extending across the fire chamber above the bottom wall thereof and having at each end a generally U-shaped handle permanently extending therefrom, each provided with a front leg and a rear leg extending through the front slot and rear slot of the adjacent end wall respectively, the rear leg of each of the U-shaped handles being captured in the rear slot against removal therefrom while the front legs are tiltable upwardly through the open tops of the front slots for upward swinging movement of the grating members about a horizontal axis extending through the rear handle legs, the slots each having a plurality of vertically spaced notches for receiving the handle legs and supporting the grating member at a plurality of vertically spaced adjustment positions, a generally vertically extending pedestal for said firebox, and a coupling assembly between said firebox and the uppermost end portion of said pedestal including swivel coupling means supporting the firebox for rotary movement about a vertical swivel axis extending through the pedestal, and said coupling assembly further including tilt coupling means supporting the firebox for tilting movement about a horizontal axis adjacent to the bottom wall of the firebox to accommodate forward and downward tilting movement of the firebox to dispose its bottom wall in a forwardly declining position at an angle of about 45 degrees from the horizontal, and said tilt coupling means having stop members for supporting said firebox at said forwardly declining position and for locating the firebox at a normal position disposing its bottom wall substantially horizontally.

4,180,051

FURNACE

Michael W. Maier, Beaver Dam, and James J. Polzin, Juneau, both of Wis., assignors to Malleable Iron Range Company, Beaver Dam, Wis.

Filed May 19, 1978, Ser. No. 907,837
Int. Cl.[2] F24C 1/14
U.S. Cl. 126—77 6 Claims



1. A furnace, useful to burn wood or coal, which comprises:

a cabinet having a double-walled construction for its sides, top, bottom and rear to provide passageways between the pairs of spaced inner and outer walls for air to be heated by said furnace and having a front wall with at least one opening, said cabinet at its upper portion having aligned openings in one pair of said spaced inner and outer walls, and having an air inlet in one of said outer walls and a heated air outlet in one of said outer walls;

a grate mounted in a lower portion of the cabinet to provide a fire chamber defined by said grate, said inner walls of said sides, top, bottom and rear of said cabinet and said front wall of said cabinet;

door means mounted on said front wall of said cabinet, said door means at said front wall of said cabinet being constructed to provide an airtight closing of said front of said cabinet when said door means is in the closed position;

a damper including a damper pipe and a damper plate, said

damper pipe being mounted on one of said door means and said front wall of said cabinet and said damper plate being pivotally mounted at its top on the front end of said pipe;

temperature sensing means;

means supporting said temperature sensing means in a manner to permit relative movement between said support means and said temperature sensing means, said support means being mounted on one of said door means and said front wall of said cabinet to support said temperature sensing means above said damper plate; and

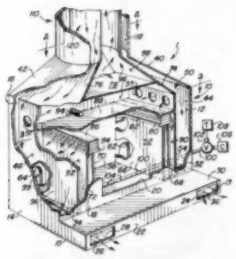
means connecting said temperature sensing means and said bottom portion of said damper plate to raise said damper plate by movement of said temperature sensing means, said furnace including means whereby said temperature sensing means is separated from said fire chamber by said front wall of said cabinet and said door means that provides radiant energy toward said temperature sensing means, and said furnace including means to separate, at least almost entirely, said temperature sensing means from any flow of air that has moved through any of said passageways of said cabinet, thus providing means whereby the main thermal energy provided to said temperature sensing means is radiant energy from either said front wall or said door means, as the case may be, that separates it from said fire chamber.

4,180,052

FURNACE FIREPLACE APPARATUS HAVING SEPARATE COMBUSTION AND HEATING AIR SYSTEMS AND SETTLING CHAMBERS FOR PARTICULATE MATTER

Delbert H. Henderson, c/o General Delivery, Prescott Valley, Ariz. 86312

Filed Oct. 19, 1978, Ser. No. 952,714
Int. Cl.[2] F24H *3/00;* **F24C** *15/30*
U.S. Cl. 126—108 **47 Claims**



38. Apparatus for producing heat from burning fuel comprising, in combination:

combustion chamber means, including a front wall, a rear wall, a first and a second side wall, a floor, and a ceiling for burning fuel;

primary settling chamber means disposed adjacent the combustion chamber and communicating therewith for receiving a flow of combustion gases and products of combustion from the burning of fuel in the combustion chamber in which heavier unburned products settle out of the flow of combustion gases and products of combustion;

passage means extending between the combustion chamber means and the settling chamber means through which the combustion gases and products of combustion flow and disposed adjacent the ceiling of the combustion chamber for providing a vertically upward flow of the said gases and products from the combustion chamber and a vertically downward flow of the gases and products from the passage means into the primary settling chambers means;

secondary settling chamber means disposed adjacent and communicating with the primary settling chamber means for receiving the flow of combustion gases and products of combustion from the primary settling chamber means in which lighter unburned products of combustion settle out of the flow of combustion gases and products of combustion;

damper chamber means disposed above the secondary settling chamber means for receiving the flow of combustion gases and products of combustion from the secondary settling chamber means and comprising a tertiary settling chamber in which the lightest unburned products of combustion settle out of the flow of combustion gases and products of combustion, and including

a damper opening between the secondary settling chamber means and the damper chamber means, and

an adjustable damper adjacent the damper opening and movable to control the flow of combustion gases and products of combustion from the secondary settling chamber means to the damper chamber means;

chimney flue means communicating with the damper chamber means for receiving the flow of combustion gases and products of combustion from the damper chamber means and for conducting them out of the apparatus;

wall means disposed about the combustion chamber means and comprising a plurality of panels defining the outer walls of the apparatus; and

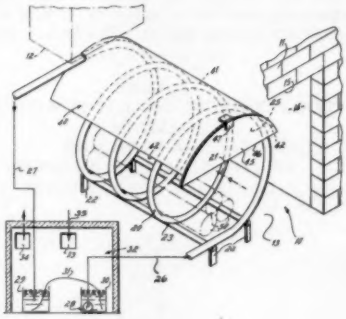
heated air chamber means disposed between the combustion chamber means and the wall means through which air flows for receiving heat from the combustion of fuel in the combustion chamber means.

4,180,053

FIREPLACE ENERGY RETRIEVER

Rashmikant Patel, 697 Yorkhaven Rd., Cincinnati, Ohio 45240

Filed Mar. 6, 1978, Ser. No. 883,699
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—132 **11 Claims**



1. Apparatus for installation in a domestic fireplace to recover waste heat from a fire therein, comprising,

a coil of tubing in the form of a spiral of several turns,

mounting structure for supporting the coil within said fireplace above the floor thereof, with the axis of the coil oriented horizontally and directed toward the front of the fireplace,

said coil presenting an opening at the front end thereof, of such diameter that fuel can be introduced through said opening into the interior of the coil from the front of the fireplace,

the lower portions of the turns of said coil constituting support means to hold said fuel for burning in the interior of said coil,

the upper portions of the turns of said coil passing above the lower portions thereof so that air heated by fuel burning within said coil rises to said upper portions,

means for circulating liquid through said coil, to be heated by the burning of said fuel, and

a semi-cylindrical hood,

said hood being positioned closely above the upper portions of said turns to slow the movement of hot air from a fire in the interior of said coil, past the upper portions, said hood having a front end closure which extends downwardly across the upper part of said opening at the front end of said coil, thereby to block forward escape of smoke from within said hood,

the hood being open at the back of said coil to permit the escape of smoke thereunder to the rear of said fireplace.

4,180,054

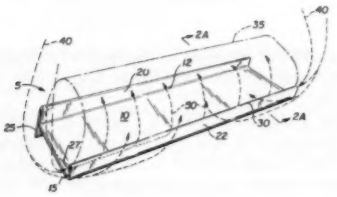
TRAY FOR INCREASING WAX IMPREGNATED LOG BURNING LIFE

Frank Romero, and Joanne L. Gardiner-Romero, both of P.O. Box 4791, Hayward, Calif. 94540

Filed Nov. 3, 1978, Ser. No. 957,498

Int. Cl.[2] F23H *13/00*

U.S. Cl. 126—164 **10 Claims**



1. A device for increasing the burning life in a fireplace fire of an artificial log of the type having as part of its composition a wax material, comprising:

a sloping tray having an upper edge normally toward the rear of the fireplace and a lower edge normally toward the front of the fireplace and extending transversely from one end of the log to the other, the tray enabling the log to substantially maintain structural integrity during combustion;

means proximate the upper edge of the tray for diverting air away from the rear-facing portions of the log;

means proximate the lower edge of the tray for defining a region into which molten wax from combustion of the log may flow, and for maintaining an air space above the surface of the molten wax such that air deflected by the air deflection means enters the air space causing the log to burn primarily along front-facing and top-facing portions thereof, thereby extending the duration of the combustion and promoting complete combustion to reduce the amount of residue, smoke, and odor due to unburned wax.

4,180,055

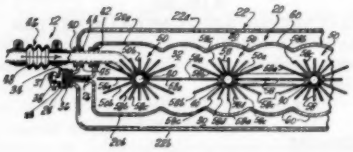
SOLAR-HEAT COLLECTOR

Walter E. Hudnall, 2157 W. 236th Pl., Torrance, Calif. 90501

Filed Jan. 3, 1978, Ser. No. 866,619

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—446 **5 Claims**



1. A solar-heat-collector device having a continuous conduit of a plurality of parallel, juxtaposed, longitudinal pipe sections for passage of fluid therethrough, said device comprising:

an inner, substantially sealed housing having said conduits positioned therein, said housing being formed to allow passage of solar radiation therethrough;

an outer, substantially sealed housing arranged to encapsulate said inner housing, and formed to allow passage of solar radiation therethrough;

a solar-heat-absorbing-collector member removably mounted to each elongated parallel length of pipe section, in order to transfer the solar heat into said pipe sections;

wherein said solar-heat-absorbing-collector member comprises a first half section of an elongated molder jacket, a second, matching, half section of an elongated molder jacket, wherein each jacket includes a plurality of longitudinally formed fin members radially disposed about the pipe, in order to absorb and transfer said solar radiation passing through said housings, wherein said molded jackets comprise a main, longitudinal, semicircular body having said elongated fin members integrally formed as part thereof, said fin members extending radially outward at different angular degrees, and wherein the width of each fin member varies according to the angular displacement thereof, and coupling means formed on said jackets and arranged to couple the half sections together, thus enclosing said elongated pipe sections therein;

an inlet and an outlet means connected to said continuous conduit to allow said flud flow to enter and discharge therefrom; and

sealing means disposed between said inner and outer housings, and between said housings and said conduit;

an insulation chamber interposed between said inner and outer housings;

said outer housing comprising a pair of oppositely positioned half-wall sections;

wherein said inner housing comprises a pair of oppositely positioned half-wall sections, said sealing means being interposed between each of said half-wall sections of both housings;

said half-wall sections of said inner housing including radiation-concentrating means to concentrate and focus radiation impinging on said fin members; and

securing means arranged to secure said wall sections and said sealing means together.

4,180,056

LAMINAR SOLAR ENERGY COLLECTING UNIT HAVING ABSORBER PLATES CONSISTING OF HOLLOW FIBERS

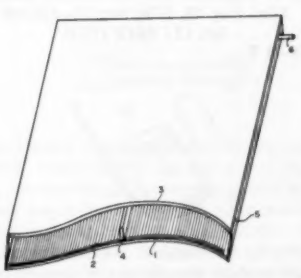
Roland Schnabel, Hofheim, and Eckart Hussmann, Oberolm, both of Fed. Rep. of Germany, assignors to JENAer Glaswerk Schott & Gen., Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,228

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618115

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—447 **16 Claims**



1. In a solar energy collecting unit comprising an absorber means for solar radiation, said absorber means comprising a plurality of hollow capillary tubes wherein said tubes have external diameters between 0.15 and 3 mm and internal diame-

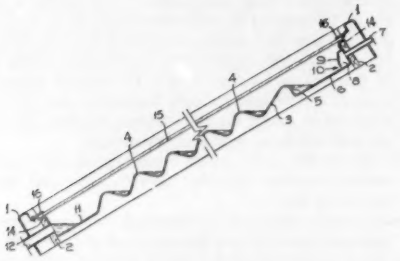
ters between 0.1 and 2.5 mm and said tubes simultaneously form a continuous absorbing surface of said collecting unit, and each of said hollow tubes have a heat-dissipating medium flowing therethrough.

4,180,057

CASCADE SOLAR FLUID HEATER

John Ward, Semaphore, Australia, assignor to Jessop Enterprises Pty. Ltd., Adelaide, Australia

Filed Sep. 16, 1977, Ser. No. 834,792
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—449 **10 Claims**



1. A solar water heater comprising a surround defining a substantially rectangular space and joining to a heat absorber surface which extends between the said surround to define an area through which water can flow over said surface when said surface is inclined in relation to a horizontal plane, an inlet to discharge water into a first trough at one edge portion of the said absorber surface, a baffle across the said inlet within said first trough, said baffle being arranged to discharge water across the width of the said first trough, said baffle terminating above the surface of the said first trough to form a transversely extending gap between it and the said surface to discharge water evenly across the width of the said trough, an outlet to receive water from a second trough at the opposite edge portion of the said absorber surface, a series of corrugations formed in said absorber transversely to the direction of flow of water from said first trough to the said second trough, and a cover over said absorber spaced therefrom which is selected to admit solar radiation to said absorber surface.

4,180,058

METHOD OF TREATING PATHOLOGICAL CONDITIONS OF THE NAIL

Jacob Brem, 11 Eaglehead Ter., Shrewsbury, Mass. 01545

Filed Aug. 15, 1978, Ser. No. 933,820
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—1 R **13 Claims**

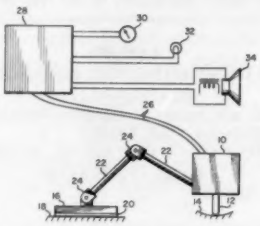
1. A method for the treatment of a pathological condition of the nail, said method comprising the steps of breaching the keratin of the nail to form an opening therein, placing a caustic-keratolytic agent in said opening to enlarge the opening, and treating the nail through said opening with a topical therapeutic agent for said pathological condition.

4,180,059

METHOD OF MEASURING INTRATHORACIC PRESSURE

Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Filed Feb. 3, 1978, Ser. No. 874,909
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—721 **2 Claims**



1. The method of obtaining a measurement corresponding to the intrathoracic pressure within the body of an individual which comprises the steps of:

mounting a transducer having a movable actuator so that said transducer is held in place and is supported by the skin immediately adjacent to the sternum and so that said movable actuator is located against the soft tissue of the suprasternal notch of the individual in a position in which variation of the surface tension of the skin occurring during breathing will be transmitted to the actuator and the transducer;

allowing the individual to breathe normally; and

monitoring the output of the transducer so as to obtain an output which corresponds to the intrathoracic pressure of an individual as the individual breathes.

4,180,060

DEVICE FOR STAINING BIOLOGICAL MATERIALS

Dolphe Kutter, Rue Beck, Luxembourg, assignor to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Continuation of Ser. No. 385,000, Aug. 2, 1973, abandoned. This application Aug. 8, 1977, Ser. No. 822,964
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1972, 2240672
Int. Cl.[2] A61B *5/14*
U.S. Cl. 128—760 **5 Claims**

1. Device for staining individual cells suspended in a biological fluid, consisting essentially of a thin tubelet and a solid coating of staining reagent for uniformly staining the suspended individual cells, which coating is applied to the inner wall of said tubelet and which is soluble in said fluid, whereby the uniform staining of the suspended individual cells for microscopic examination is effected upon removal of the reagent from the inner wall of said tubelet when dissolved in said fluid.

4,180,061

ELECTRONIC SPHYGMOMANOMETER

Shinobu Kamimura, and Hideki Yamamoto, both of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 29, 1977, Ser. No. 855,716
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—681 **2 Claims**

1. An electronic sphygmomanometer comprising:

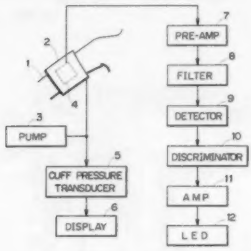
an inflatable cuff;

a pressure displaying means for displaying pressure in said cuff;

a microphone attached to said cuff;

an indicating means for indicating the appearance of Korotkov sounds; and,

an indicating signal producing means for supplying indicating signals to said indicating means, including a preamplifying circuit for amplifying output signals of said microphone, a bandpass filtering circuit receiving the output of said pre-amplifying circuit and passing Korotkov sound



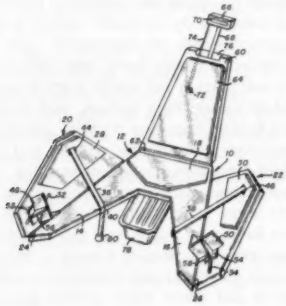
signals, said bandpass filtering circuit having a passband with a low cutoff frequency of 40 Hz and a high cutoff frequency of 90 Hz, a detecting circuit for detecting said Korotkov sound signals, a discriminating circuit for discriminating output signals of said detecting circuit, and an amplifying circuit for amplifying the output of said discriminating circuit.

4,180,062

PORTABLE CHILDBIRTH CHAIR WITH ELECTRONIC MONITORING APPARATUS

James Alberti, 106 Richardson Rd., Santa Cruz, Calif. 95066, and Helmut Schlosser, 1425 N. Rodeo Gulch Rd., Soquel, Calif. 95073

Filed Apr. 10, 1978, Ser. No. 894,901
Int. Cl.[2] A61N *5/04*
U.S. Cl. 128—698 **26 Claims**



1. A portable childbirth chair comprising:

a base having a seat portion and two outwardly extending leg portions:

a first leg support hingedly attached to one side of a first of said leg portions, and rotatable between a leg support position and a folded position;

first means for adjusting the inclination of said first leg support relative to said base when it is in its leg support position;

first footrest means;

first means for attaching said footrest means to said first leg rest;

a second leg support hingedly attached to one side of the second of said leg portions and rotatable between a leg support position and a folded position;

second means for adjusting the inclination of said second leg support relative to said base when it is in its leg support position;

second footrest means;

second means for attaching said second footrest means to said second leg support;

a backrest hingedly attached to the seat portion of said base and rotatable between a back support position and a folded position; and

third means for adjusting the inclination of said backrest relative said base when it is in its back support position;

whereby when the chair is in use, a woman undergoing labor may sit upon said seat portion, place her feet upon said footrests with her legs supported by said leg supports and recline against said backrest, and when said chair is not in use the leg supports and backrest may compactly fold over said base so that the chair may be more easily stored and transported.

24. A portable childbirth chair as recited in claim **1** further comprising:

an electronic monitoring apparatus; and

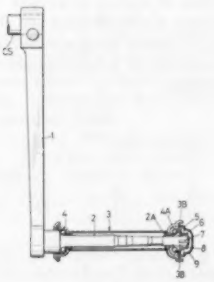
means for connecting said monitoring apparatus to a rearward portion of said backrest.

4,180,063

FOOT-OPERATED ROTARY MASSAGING DEVICE

Toshio Takeuchi, Kariya, Japan, assignor to Kabushiki Kaisha Oichi, Kariya, Japan

Filed Mar. 7, 1978, Ser. No. 884,243
Claims priority, application Japan, Dec. 29, 1977, 52-160386
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—25 B **10 Claims**



1. A foot-operated rotary massaging device comprising a horizontal shaft rotatable about its own axis, a pair of cranks each having one end secured to one end of said shaft, a pedal spindle having one end secured to the other end of said each crank at right angles thereto, a pedal rotatably mounted on each of said pedal spindles, at least one eccentric member having a rotatable annular outer peripheral portion and an axial hole eccentric to the center of said annular outer peripheral portion and mounted to each pedal spindle through said axial hole, wherein said eccentric member massages or stimulates the sole of a foot placed on said each pedal.

4,180,064

SYSTEM FOR DELIVERING AGENT TO ENVIRONMENT OF USE OVER PROLONGED TIME

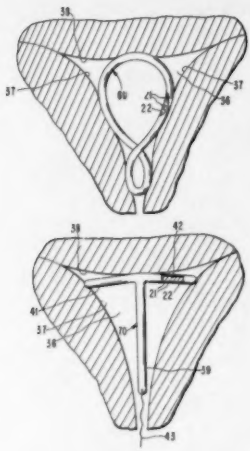
Jorge Heller, Palo Alto, Calif., and Richard W. Baker, Bend, Oreg., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 591,443, Jun. 30, 1975, Pat. No. 4,014,987, which is a continuation-in-part of Ser. No. 476,246, Jun. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 318,831, Dec. 27, 1972, abandoned. This application Dec. 15, 1976, Ser. No. 750,701

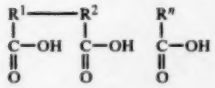
The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Int. Cl.[2] A61K *31/00, 31/56, 47/00, 9/02;* A61F *5/46;* A61M *31/00*

U.S. Cl. 128—130 4 Claims



1. An intrauterine device for the controlled and continuous local administration of uterine acceptable drug to the uterus consisting essentially of a body sized and shaped as an intrauterine device and formed of drug release rate controlling uterine acceptable material of a hydrophobic poly(acid) represented by the formula:



wherein the R's are organic radicals independently selected to provide, on average, from 8 to 22 total carbon atoms for each carboxylic hydrogen, said body of drug release rate controlling material containing a member selected from the group consisting of progestational drugs that have antifertility properties and estrogenic drugs that have antifertility properties dispersed therethrough, said sized and shaped device adapted for insertion and retention prolonged in the uterus, wherein the release rate controlling material erodes at a controlled and continuous rate over a prolonged period of time in response to the environment of the uterus, thereby releasing the dispersed antifertility drug to the uterus at a controlled and continuous rate over a prolonged period of time to produce the desired effect.

4,180,065

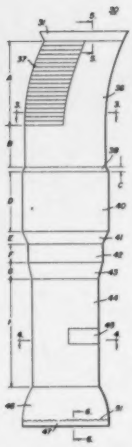
ANTI-EMBOLISM STOCKING

Omer J. Bowen, Fayetteville, Ak., assignor to Bear Brand Hosiery Co., Chicago, Ill.

Filed Jan. 23, 1978, Ser. No. 871,181

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—165 9 Claims



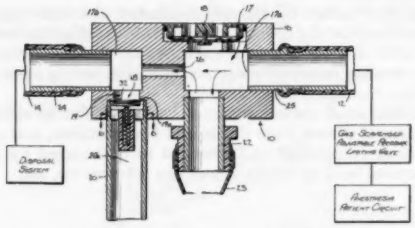
1. A rotary knitted one-piece anti-embolism stocking comprising a seamless tubular body integrally knitted with at least certain of the courses therein of elastomeric yarn so as to impart an elastic character to said body, said body including a foot portion and a calf portion and a knee portion and a lower thigh portion and an upper thigh portion, said body further including first and second transition portions connecting said calf portion respectively to said foot portion and said knee portion and a third transition portion connecting said knee portion to said lower thigh portion, said foot portion having a toe end disposable in use at the ball of the wearer's foot and said thigh portion having an upper end disposed away from said knee portion, said calf portion having a cross section greater than the cross section of said foot portion and less than the cross section of said lower thigh portion and said knee portion having a cross section greater than the cross section of said lower thigh portion and substantially equal to the cross section of said upper thigh portion, said first transition portion having a cross section which increases gradually from said foot portion to said calf portion and said second transition portion having a cross section which increases gradually from said calf portion to said knee portion and said third transition portion having a cross section which decreases gradually from said knee portion to said lower thigh portion, the variation in the cross section of said tubular body being such that in use on a wearer's leg said tubular body has a circumferential tension which decreases essentially uniformly from said toe end of said foot portion to said upper end of said thigh portion while said enlarged knee portion accommodates flexing of the wearer's knee, whereby said stocking applies to a wearer's leg a pressure which decreases essentially uniformly from the ball of the wearer's foot to the upper portion of the wearer's thigh.

4,180,066

SAFETY INTERFACE AND VALVE FOR ANESTHESIA GAS SCAVENGING

Ralph A. Milliken, Spring Valley, N.Y.; Terence D. Wall, Hackensack, N.J., and Martin Boelens, Zaandam, Netherlands, assignors to Vital Signs, Inc., East Rutherford, N.J.

Filed Oct. 20, 1977, Ser. No. 844,045
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—205.24 8 Claims



1. A safety interface for connection between an anesthesia patient circuit and a disposal system, said interface comprising:

(a) a housing defining a passageway having an upstream end and a downstream end, said passageway having a restrictor between said upstream and downstream ends partially obstructing flow therethrough, said housing also defining a port extending from the downstream end of the passageway to an opening on the exterior of said housing, said housing including a raised ridge surrounding said opening;

(b) means for connecting the upstream end of said passageway to the waste anesthetic gas outlet of an anesthesia patient circuit;

(c) means for connecting the downstream end of said passageway to a disposal system;

(d) means for connecting a reservoir to the upstream end of said passageway;

(e) negative pressure relief valve means in communication with said passageway and responsive to a negative pressure therein;

(f) a chimney affixed to said housing and extending outwardly therefrom, so that the bore of said chimney is in communication with said opening;

(g) combined positive and negative pressure relief valve means responsive to positive and negative pressures in said passageway and constructed and arranged to interrupt the communication between said opening and the bore of said chimney said combined valve means including:

a spindle;

a first disc mounted on said spindle;

a spindle receptacle secured to the inside of said chimney and defining a pocket having an open end confronting said opening;

a coil spring seated in the pocket of said spindle receptacle and surrounding at least an end portion of said spindle in slidable relation therewith; and

a second disc having at least one aperture therein, said second disc slidably engaging said spindle and situated between said first disc and said spindle receptacle, said spring engaging said second disc and biasing said second disk towards said housing, said second disk being constructed and arranged for abuting engagement with said raised ridge, said first disk being constructed and arranged to be located within said opening and overly all of the apertures in said second disk, and

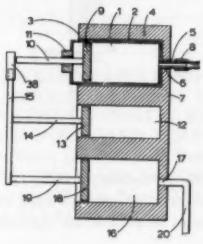
(h) said negative pressure relief valve means opening in response to a greater negative pressure than said negative pressure to which the negative pressure relief valve portion of said combined positive and negative pressure relief valve means is responsive.

4,180,067

APPARATUS FOR DELIVERING FLUIDS WITH CONTROLLED RATES OF FLOW

Michael L. Derlien, Wembley, England, assignor to Pye (Electronic Products) Limited, Cambridge, England

Filed Sep. 26, 1977, Ser. No. 836,790
Claims priority, application United Kingdom, Sep. 28, 1976, 40187/76
Int. Cl.[2] A61M *05/00*
U.S. Cl. 128—214 F 5 Claims



1. An apparatus for delivering fluid with controlled rates of gradual flow from a removable container placed in the apparatus, comprising

a frame having a cavity adapted for housing a removable storage container having a movable wall and an outlet tube, the volume of which container can be reduced by movement of the wall so as to supply fluid to the outlet tube;

at least one first cylinder arranged in the frame and closed at one end;

a first piston slidably disposed within and in sealed engagement with the first cylinder, the first cylinder being evacuated when the first piston is substantially at the open end of the first cylinder so that atmospheric pressure acts upon the first piston to drive it towards the closed end of the first cylinder, and

means for coupling said first piston to the movable wall of a storage container placed in the cavity for movement of the wall responsive to movement of the first piston toward the closed end of the first cylinder, so arranged that said piston movement produces a reduction of the volume of the storage container.

4,180,068

BI-DIRECTIONAL FLOW CATHETER WITH RETRACTABLE TROCAR/VALVE STRUCTURE

Stephen C. Jacobsen; Robert L. Stephen, and Peter Hansen, all of Salt Lake City, Utah, assignors to Motion Control, Incorporated, Salt Lake City, Utah

Filed Apr. 13, 1978, Ser. No. 895,858
Int. Cl.[2] A61M *5/00;* A61B *17/34*
U.S. Cl. 128—214 R 11 Claims

1. A bi-directional flow catheter comprising

an elongate primary tube having open rearward and forward ends, a side opening in one side thereof, and duct means located rearwardly of said side opening for enabling communication with the interior of the primary tube, and

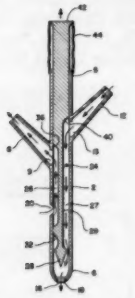
a trocar/valve member disposed in and slidable longitudinally within said primary tube between an insert position and a flow position, said member comprising

an elongate body, one end of which is tapered, said tapered end protruding from the open forward end of the primary tube when the trocar/valve member is in the insert position to facilitate puncture of tissue into which the catheter is inserted,

occluding means for preventing communication between the open forward end of the primary tube and said side opening,

first passage defining means for enabling communication

between said side opening and said duct means when the trocar/valve member is in the flow position, and



second passage defining means for enabling communication between the open forward end of the primary tube and a point located at the rearward end of said primary tube.

4,180,069

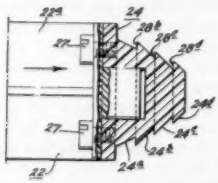
PLUNGER ROD AND PISTON FOR A SYRINGE

Ralph Walters, Perkiomenville, Pa., assignor to The West Company, Phoenixville, Pa.

Continuation of Ser. No. 691,902, Jun. 1, 1976, abandoned. This application Mar. 29, 1977, Ser. No. 782,562

Int. Cl.[2] A61M *5/315*

U.S. Cl. 128—218 P **10 Claims**



1. A plunger rod for a syringe assembly comprising an elongated stem and a tip at one end adapted to seat in a pocket in a piston, said tip being of generally truncated christmas tree shape and including a plurality of frusto-conical tip sections decreasing in cross wise dimension progressively from the base to the outer terminal end of the tip thereby defining a series of circumferentially extending axially spaced radially directed shoulders between adjacent tip sections, the included taper angle of the conical wall of the outermost tip section being greater than that of the remaining tip sections and the conical wall of the other tip sections decreasing progressively to the base of the tip.

4,180,070

DISPOSABLE DOUBLE VIAL SYRINGE

Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 29, 1977, Ser. No. 828,686

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—218 M **17 Claims**

1. A prefilled, readily activated syringe comprising:

a first holding means defining a syringe barrel with an open end and a central passageway;

a first small volume container having a medicament or diluent therefor constructed and arranged to be engaged by said holding means in a sliding relationship;

a pierceable stopper in sealing and slidable engagement with said first container;

a double-pointed piercing cannula member having a hub portion disposed in said central passageway;

means operatively associated with said hub and said central passageway defining at least two frictional stop positions for said cannula hub;

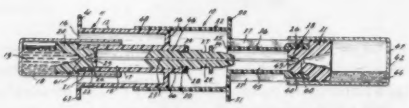
an adapter housing constructed and arranged for movable engagement over said syringe barrel;

a first contact surface operatively associated with said cannula hub;

a second surface operatively associated with said adapter housing for engagement with said first contact surface;

a second holding means for a second small volume container extending from said adapter housing and having a passage therethrough for said cannula;

a second small volume container having a differing medicament or diluent from that in said first container, said container constructed and arranged to be engaged by said second holding means in a sliding relationship; and



a pierceable stopper in sealing and sliding engagement with said second container;

said first and second holding means constructed and arranged with respect to said containers to position said container stoppers out of contact with the piercing points of said cannula in one position and to afford piercing of both stoppers when said adapter housing is moved in a direction toward said first container so that said second container vial is pierced first and upon further movement of said adapter housing said first and second contact surfaces will engage to effect movement of said cannula hub with respect to said central passageway of said syringe barrel by means of said frictional stop positions to effect a piercing of said stopper in said first container whereby fluid communication is established between said containers to effect mixing of said medicament and said diluent with expulsion of said mixture from said syringe after removal of said adapter and said second container.

4,180,071

DEVICE FOR WITHDRAWING INJECTION SOLUTION

Shigeo Oiwa, No. 10-6, 2-chome, Nishimaiko, Tarumi-ku, Kobe, Japan

Filed Sep. 23, 1977, Ser. No. 835,955

Claims priority, application Japan, Oct. 1, 1976, 51-118755

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—218 N **4 Claims**

1. A device for withdrawing an injection solution comprising:

a tube, said tube having one open end which is adapted to be intimately fitted to the base portion of an injection needle and another open end which is oblique;

a filter medium packed into said tube adjacent said other end, said filter medium having pores of 3 to 5μ in diameter;

two internal projections on said tube, one adjacent either end of said filter medium whereby said projections maintain the position of said filter medium within said tube; and

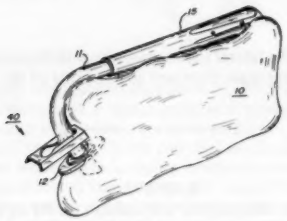
the portion of said tube surrounding said filter medium having a lesser diameter than the remainder of said tube, said lesser diameter increasing the density of said filter medium.

4,180,072

DISPOSABLE SYRINGES

Vincent R. Sneider, 3422 Hallcrest Dr. N.E., Atlanta, Ga. 30319

Division of Ser. No. 724,724, Sep. 20, 1976, which is a division of Ser. No. 592,037, Jun. 30, 1975, Pat. No. 4,014,332, which is a continuation-in-part of Ser. No. 389,506, Aug. 20, 1973, abandoned. This application Dec. 21, 1977, Ser. No. 862,746
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—227 **8 Claims**



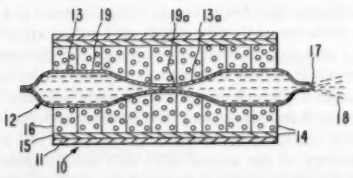
1. A syringe for vaginal douche and enemas and the like, said syringe including: (a) a flexible container; (b) a discharge tube connected to the container in a fluid-tight manner; (c) at least one of the component portions of a fluid mix to be used with said syringe container in this flexible container; (d) a manipulative cutoff valve associated with said discharge tube, said valve when open permitting the flow of fluid from the container, this manipulative cutoff valve being a keyhole-type clamp mounted on the tubing intermediate its ends, said clamp having a keyhole-type aperture in its midportion and the sides formed with bent edges which when urged toward each other tend to bend the midportion of the clamp and in which the midportion is weakened by score lines extending from the keyhole aperture to the longitudinal ends, these score lines assisting in the deliberate breaking of the clamp when the bent sides are urged toward each other, and (e) a discharge nozzle attachable to the outlet end of the discharge tube.

4,180,073

DEVICE FOR DELIVERING DRUG TO BIOLOGICAL ENVIRONMENT

Alan S. Michaels, San Francisco, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Aug. 29, 1977, Ser. No. 828,473
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 **8 Claims**



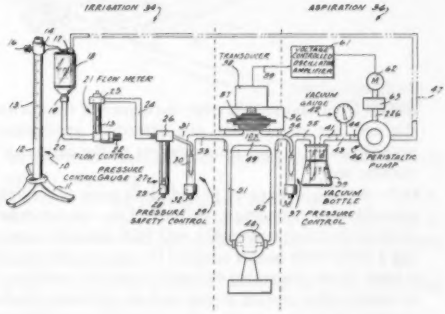
1. A drug delivery device comprising:
(a) a drug;
(b) a housing having a shape-retaining wall defining an internal space, said housing having at least one opening connecting the space with the exterior of the device;
(c) a container in the housing, said container having a collapsible wall surrounding a reservoir for storing the drug and a passageway for delivering drug from the container to the exterior of the device; and,
(d) a laminate in the housing surrounding the container comprising a lamina of an absorbent material and a lamina of a swellable hydrophilic cross-linked polymer, said laminate capable of imbibing fluid into the housing thereby causing the laminate to expand and exert pressure on the container which collapses said container and concomitantly pumps drug through the passageway from the device at a controlled rate over a prolonged period of time.

4,180,074

DEVICE AND METHOD FOR APPLYING PRECISE IRRIGATION, ASPIRATION, MEDICATION, ULTRASONIC POWER AND DWELL TIME TO BIOTISSUE FOR SURGERY AND TREATMENT

Edward J. Murry, Palos Park, and Joseph F. Brumbach, Niles, both of Ill., assignors to Fibra-Sonics, Inc., Chicago, Ill.

Filed Mar. 15, 1977, Ser. No. 777,582
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—276 **15 Claims**



1. An ultrasonic instrument comprising an ultrasonic generator, an operating handpiece with a hollow operating tool and an ultrasonic motor in said handpiece and connected to said ultrasonic generator for operating in bio-cavities, a subsidiary pressure balancing cavity, an irrigation fluid supply separate from and connected to said balancing cavity, a first tube and a second tube connected to said balancing cavity, said balancing cavity being substantially larger than a bio-cavity to be operated within, said first tube being connected at one end to said balancing cavity and at the other end to said hollow operating tool of said handpiece, said second tube being connected at one end to said balancing cavity and the other end being adapted to be placed in fluid communication with the interior of a bio-cavity to be operated within, automatic means for accurately controlling the input fluid pressure in said balancing cavity, means for removing fluid connected to said balancing cavity at a point spaced from said fluid supply connection, said first and second tubes being connected to said balancing cavity at points located between the connection points of said fluid supply and said means for removing fluid, and one of said tubes being connected at a point closer to the fluid supply connection point than the other of said tubes.

4,180,075

OPHTHALMOLOGICAL SURGICAL INSTRUMENT

Gerald P. Marinoff, 8 Rockford Dr., West Nyack, N.Y. 10994

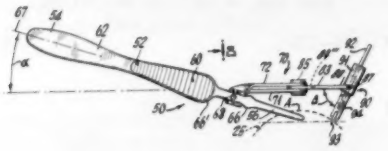
Filed Apr. 5, 1977, Ser. No. 784,682
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 **19 Claims**

1. A hand-held surgical instrument for performing ophthal-

mological incisions in the form of an arc of a circle centered on the cornea, said instrument comprising:

a fixation assembly having a pair of elongated arms which are fixed at one end thereof to each other, the other ends thereof being movable toward and away from each other, the pair of arms lying in common a plane which, when positioned for use, is at a minor angle to a plane tangent to the center of the cornea, a prong carried at said other end of each said elongated arms for insertion into the globe of the eye to fix the position of the arms, and finger grip means on said pair of arms so that the instrument may be held in one hand of the surgeon on one side of an eye to grip the eye therewith;

a linkage assembly connected to at least one of said arms of the fixation assembly and at a minor complementary angle to the fixation arm and, when positioned for use, extending therefrom above the eye in a plane approximately parallel to said plane tangent to the center of the cornea, the linkage assembly having a pivot point positioned equi-



distant from said prongs over the center of the cornea of the eye, the pivot point axis extending approximately perpendicular to said plane tangent to the center of the cornea; and

a knife assembly connected to said pivot point of the linkage assembly and extending to the side of the eye opposite the arms of the fixation assembly, said knife assembly comprising a knife blade holder adapted for manual manipulation, a knife blade removably carried by said knife holder, and a cutting edge carried at one end of said knife blade for making an incision in the eye, said knife assembly being pivotable about the pivot point on said linkage assembly so that said knife holder may be moved through an arc of a circle by the other hand of said surgeon and so that said cutting edge will penetrate the eye and describe an incision in the form of an arc of a circle when sufficient hand pressure is applied thereto, the operative field being substantially unobstructed by the surgical instrument when the field is viewed from above.

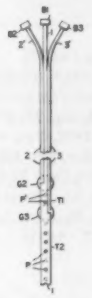
4,180,076

NASOGASTRIC CATHETERS

Victor M. Betancourt, Pedro Laplace No. 30 Apt. 3 Colonia Nueva Anzures, Mexico 5 D. F., Mexico

Filed Jan. 13, 1978, Ser. No. 869,206
Claims priority, application Mexico, May 6, 1977, 169032
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 B **6 Claims**

1. A nasogastric catheter comprising a tube of relatively flexible material defining a main duct extending from one end of the tube to the other end thereof, first and second inflatable vessels which are mounted at the exterior of said tube and through which said tube extends, said vessels being situated approximately three-quarters of the way along the tube from said one end to said other end thereof and being spaced from one another along said tube, and first and second subsidiary conduits extending within the tube from said one end and communicating with the first and second vessels respectively but being isolated from said main duct, said tube being formed with at least one lateral perforation between the first and second vessels and a plurality of lateral perforations after the



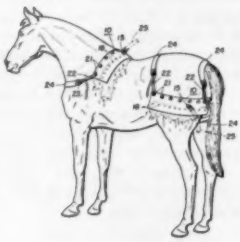
second vessel, the lateral perforations establishing communication between said main duct and the exterior of the tube.

4,180,077

DEVICE FOR TREATING SWOLLEN SURFACE AREAS ON HORSES AND THE LIKE

Lida L. McCowan, 8370 N. 43rd St., Augusta, Mich. 49012

Filed Aug. 17, 1977, Ser. No. 825,309
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—402 **4 Claims**

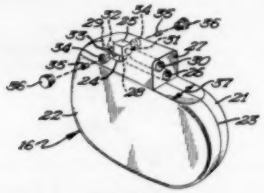


1. Apparatus for treatment of swollen surface areas on larger animals such as horses comprising: an envelope-like receptacle effective to contain a liquid, the receptacle including first and second elongated panels of flexible sheet material forming oppositely facing sidewalls, each of the panels having a pair of opposite side edges and a pair of opposite end edges forming side and end edges of the receptacle, the panels being sealingly secured to each other along their corresponding edges in face to face relation; liquid inlet means for supplying liquid to the receptacle, the liquid inlet means being disposed in a first of the panels between said side edges and intermediate said end edges; a plurality of liquid outlet means for allowing liquid in the receptacle to flow therefrom, the liquid outlet means being disposed in a second of the panels longitudinally therealong between said end edges and intermediate said side edges; and means for applying the receptacle about or upon a portion of the anatomy of the animal with said second panel in facing relationship to the surface area to be treated effective to allow the outlet means to discharge liquid thereupon, the applying means including attaching means disposed adjacent said panel end edges and connectable together for attaching the receptacle about an animal's leg and suspending means disposed adjacent one of said panel side edges for suspending the receptacle from other portions of an animal's body either in conjunction with or independently of the attaching means.

4,180,078
LEAD CONNECTOR FOR A BODY IMPLANTABLE STIMULATOR

Kenneth M. Anderson, Bloomington, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 7, 1978, Ser. No. 894,360
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **16 Claims**

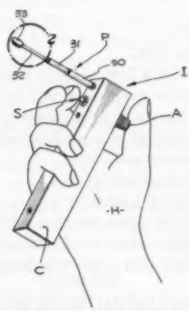


1. In a body implantable stimulator of the type having furcated lead means and a signal generator assembly including signal generator means and connector means for interconnecting said signal generator means and the lead means furculae, at least the lead means furculae being wrapped around said signal generator assembly on implantation, the improvement wherein said connector means comprises jack means for receiving said lead means furculae, said jack means comprising means for compensating for non-uniform spacing of said jack means from said signal generator means to facilitate the conformance of said furculae to the configuration of said signal generator assembly on wrapping of said furculae around said signal generator assembly.

4,180,079
ELECTROACUPUNCTURE INSTRUMENT

Thomas W. Wing, 380 E. Baseline Rd., Claremont, Calif. 91711

Filed Mar. 16, 1978, Ser. No. 887,003
Int. Cl.[2] A61H *39/00*; A61N *1/36*
U.S. Cl. 128—422 **4 Claims**



1. An electroacupuncture instrument comprising, in combination:

metallic housing means of such size and configuration as to be conveniently grasped within one hand of the user and in surface-to-surface contact with at least about a square inch of the skin surface thereof;

a pulse generating circuit within said metallic housing means including a low-frequency oscillator adapted to produce essentially a square-wave output signal, a high frequency oscillator adapted to produce essentially a square-wave output signal, the output signal of said low-frequency oscillator being of substantially greater amplitude than the output signal of said high-frequency oscillator, one of the output terminals of each of said oscillators being connected together, and an output resistor connected between the other output terminals of said two oscillators so that the difference between said two output signals appears across said resistor;

selective means for selecting a portion of said resistor across which to derive a composite output signal of selected amplitude, said selective means having two output terminals, one of said output terminals being connected to said metallic housing means; and

probe means connected to the other of said output terminals for applying said composite output signal to the skin of a patient.

4,180,080
ELECTRODE ASSEMBLY FOR SENSING HEART ACTIVITY

John B. Murphy, West Roxbury, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 838,501, Oct. 3, 1977, Pat. No. 4,149,528. This application Apr. 24, 1978, Ser. No. 899,049
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—642 **10 Claims**

1. An electrode assembly for sensing heart activity from body tissue comprising:

a guide tube having proximal and distal ends;

an electrically conductive spiral retaining coil disposed in the proximal end of said guide tube and extendable from the proximal end;

a signal lead attached to said retaining coil and extending through said guide tube to the distal end thereof;

a handle disposed on the distal end of said guide tube in releasable engagement with said signal lead;

said handle being rotatable to rotate said retaining coil by rotating said signal lead;

said handle being movable along the longitudinal axis of said guide tube to permit disengagement of said handle from said signal lead; and

a spring disposed at the distal end of said guide tube biasing said handle away from the distal end to disengage said handle from said signal lead after selected rotation of said handle.

10. An electrode assembly for sensing heart activity from body tissue comprising:

a guide tube having proximal and distal ends;

a rotatable electrode holder disposed in said guide tube at the proximal end thereof;

an electrically conductive spiral retaining coil mounted on said electrode holder and extending toward the proximal end of said guide tube;

a signal lead attached to said retaining coil and extending through said guide tube to the distal end thereof;

a rotatable drive member coupled to said holder and extending through said guide tube to the distal end thereof;

a handle disposed at the distal end of said guide tube and coupled to said drive member for rotating said drive member to rotate said holder and the spiral retaining coil mounted thereon; and

a safety stop disposed at the proximal end of said guide tube for limiting the rotation of said retaining coil, said safety stop including a ring releasably disposed on said proximal end and having an internal thread engaging said spiral retaining coil to permit said retaining coil to be screwed into said ring, said ring being engagable with said elec-

trode holder upon predetermined rotation of said retaining coil to terminate rotation of said retaining coil;

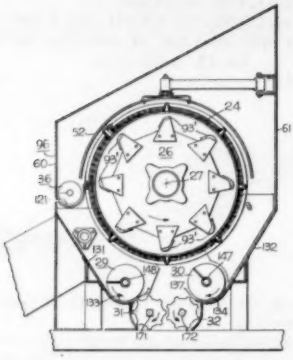
said retaining coil having a decreasing outside diameter and said ring having a decreasing inside diameter along the longitudinal axes of said coil and said ring toward the distal end of said guide tube.

4,180,081

DISTRIBUTION AUGERS FOR AN AXIAL FLOW COMBINE

J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 809,408, Jun. 23, 1977, abandoned.
This application Oct. 2, 1978, Ser. No. 947,471
Int. Cl.[2] A01F *12/18*
U.S. Cl. 130—27 R **10 Claims**



1. In a combine having a header at its front end and a feeder for conveying harvested crop material from the header upwardly and rearwardly, the combination comprising:

a frame structure having walls defining a housing for a cylinder cage and a threshing cylinder, including front, rear, right and left side walls,

a generally cylindrical cage mounted on said frame structure within said housing and extending between said left and right side walls with a generally horizontal axis extending in transverse relation to said feeder including

a radially opening inlet adjacent one axial end of said cage through which said feeder discharges harvested crop radially inwardly into said cage and

an outlet at the other axial end of said cage through which crop material is discharged from said cage, said cage being of a substantially greater axial dimension than the transverse width of said feeder and having a plurality of radial openings in its periphery permitting passage of threshed material through substantially its entire periphery,

a threshing cylinder within said cage extending between said right and left walls and mounted on said frame for rotation on said horizontal transverse axis,

means causing harvested crop material to move axially within said cage from said inlet to said outlet during a harvesting operation,

said front and rear side walls of said housing being spaced from said cage to permit threshed material passing through the periphery of the cage to fall to the bottom of said housing,

a cleaning shoe assembly disposed generally below said cylinder cage, the width dimension of said shoe assembly being substantially less than the axial length dimension of said cage,

a transversely extending, downward opening feeding slot in said housing below said cage and above said cleaning shoe assembly, said slot extending transversely substantially coextensive with the width of said cleaning shoe assembly and

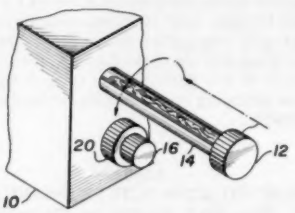
a conveying mechanism operatively disposed within and at the bottom of said housing operable to move threshed material deposited in the bottom of the portion of the housing extending laterally beyond said cleaning shoe assembly to said slot.

4,180,082

APPARATUS FOR MANUFACTURING CIGARETTES OR THE LIKE

Bernard Wachter, Kings Point, N.Y., assignor to Pyro Dynamics, Ltd., Hicksville, N.Y.

Filed May 30, 1978, Ser. No. 910,439
Int. Cl.[2] A24C *5/42*
U.S. Cl. 131—26 **13 Claims**



1. Apparatus for manufacturing cigarettes or the like, said apparatus comprising:

(a) a housing;

(b) a tray which is

(i) open on one side,

(ii) movable from a first position within said housing to a second position exterior of said housing, and

(iii) rotatable from a first orientation in which said tray is open upwardly to a second orientation in which said tray is open downwardly;

(c) a cylindrical form which is

(i) located beneath said tray,

(ii) movable from a first position within said housing to a second position exterior of said housing,

(iii) divided into two semi-cylindrical form components; and

(iv) hinged along its axial length between the semi-cylindrical form component to permit opening and closing of said form;

(d) first means for opening and closing said form

(i) along its axial hinge

(ii) so that said form is open upwardly, at which time it is positioned to receive a charge of tobacco or the like dropped from said tray onto a sheet of wrapping material located on said form, and closed around said charge of tobacco and sheet of wrapping material to form a cigarette; and

(e) second means for opening said form

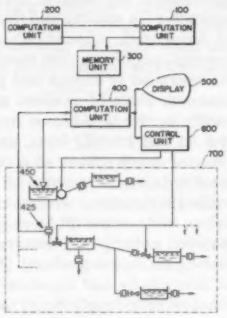
(i) along its axial hinge

(ii) so that said form is open downwardly, at which time it is positioned to release the completed cigarette or the like.

4,180,083
SYSTEM FOR CONTROLLING FLOW RATE IN PIPELINES

Shinichiro Miyaoka, Nishi-tama; Kuniaki Matsumoto, and Junichi Hatakeyama, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 18, 1977, Ser. No. 843,253
Claims priority, application Japan, Oct. 20, 1976, 51/124980
Int. Cl.[2] F04B *41/02*
U.S. Cl. 137—101.25 **11 Claims**



1. A system having pipelines, a plurality of reservoirs and means for controlling the flow of fluid through said pipelines to, from, and between said plurality of reservoirs, comprising:

valves and pumps installed in the pipelines for regulating the flow rate of fluid passing therethrough;

first means for calculating the amount of predicted water demand $Q_{je}(t)$ which is supplied from any reservoir (j) to consummers and for producing an output signal representative thereof;

second means operatively associated with said first means for calculating flow rate $Q_{ij}(t)$ changing with time (t) of fluid flowing in a pipeline from a reservoir (i) to a reservoir (j), from fluid level $H_i(t)$, $H_j(t)$;

third means operatively associated with said first and second means for calculating fluid level $H(t+1)$ at the time $(t+1)$ of the reservoir (j) from the predicted demand $Q_{je}(t)$ received from the first means, the amounts of inflow $Q_{ij}(t)$ and outflow $Q_j(t)$ thereof and the water level $H_j(t)$ at the time (t) of the reservoir (j); and

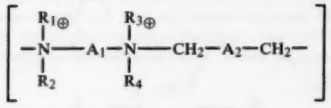
fourth means operatively associated with said first, second, and third means for controlling manipulatable variables of the pumps and valves when the water level $H_j(t+1)$ thus obtained is below a predetermined lower limitation LH_j or over an upper limitation UH_j so as to keep actual levels of fluid within said reservoirs between predetermined levels.

4,180,084
COSMETIC COMPOSITIONS CONTAINING POLYMERIC QUATERNARY AMMONIUM SALTS

Hans Wegmüller, Riehen, Switzerland; Ulrich Horn, Greenville, S.C.; Walter Hungerbühler, and Jaroslav Haase, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 25, 1978, Ser. No. 899,940
Claims priority, application Switzerland, May 2, 1977, 5463/77
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 **15 Claims**

1. Hair-care compositions in the form of aqueous, alcoholic or aqueous alcoholic solutions, creams, gels, emulsions, or of aerosols which optionally contain a propellant, said compositions containing 0.01 to 10 percent by weight of at least one polymeric quaternary ammonium salt which contains cationic units of the formula

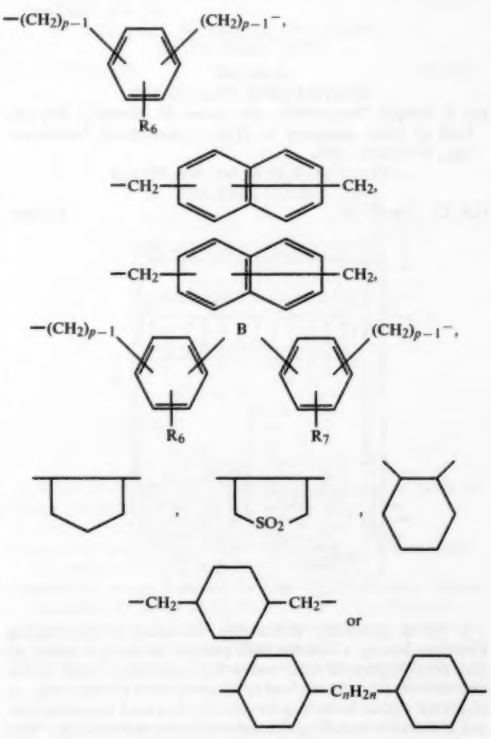


wherein

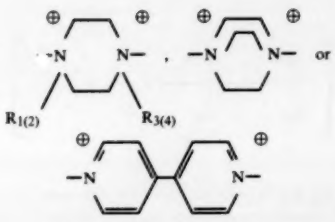
R_1, R_2, R_3 and R_4 are the same or different and represent unsubstituted or substituted alkyl, cycloalkyl or alkenyl of at most 20 carbon atoms, aryl or aralkyl, or (R_1 and R_2) and/or (R_3 and R_4) together with the nitrogen atom to which they are bonded, form an unsubstituted or substituted heterocyclic ring containing 3 to 6 ring members,

A_1 represents $-(CH_2)_m$, wherein m is an integer from 1 to 20, which can be interrupted by at least one —S—,

or —CH=CH— group or substituted by at least one member selected from the group consisting of hydroxyl, halogen, nitrile, alkyl, hydroxy- alkyl, alkoxy, carboxyl or carbalkoxy or by at least one unsubstituted or substituted aryl or aralkyl radical, or represents polyoxyalkylene, or a radical of the formulae

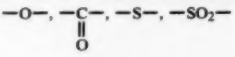


or together with the nitrogen atoms and at least one of the substituents bonded thereto A_1 represents a radical of the formulae



R_6 and R_7 represent hydrogen, alkyl, hydroxyl or haloalkyl of 1 to 4 carbon atoms, hydroxyl, halogen, carboxyl, carbalkoxy or phenyl,

B represents the direct bond,

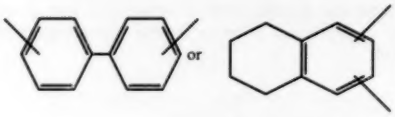


or unsubstituted or substituted alkylene,

n is an integer from 1 to 6,

p is an integer from 1 to 3, and

A_2 represents a radical of the formula



4,180,085

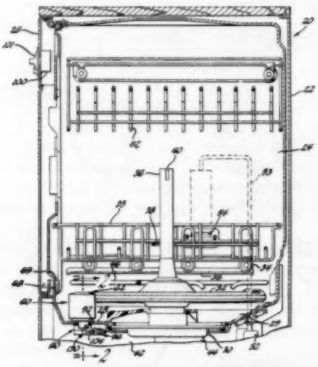
DISHWASHER FILL FLOAT

Jon F. Berges, Waynesville, and James M. Woolley, Dayton, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 3, 1978, Ser. No. 957,666

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—57 D **1 Claim**



1. In an automatic dishwasher including a dishwashing chamber having a bottom wall portion forming a sump, an electrically-operated inlet valve for supplying liquid to the chamber to a predetermined normal-fill level in the sump, an electrical circuit including electrically-powered sequence control means for operating the dishwasher in accordance with a predetermined operational cycle, a switch electrically connected by said circuit to the inlet valve, said switch including an actuator normally being resiliently biased in a first position opening the circuit to prevent energization of said inlet valve, said actuator being movable to a second position closing the circuit to permit energization of said inlet valve, a float assembly for said fill valve including a float in the form of an inverted cup including a closed top with an elongated stem extending from said closed top on the principal axis of said float; said float operative to remain at a first lower rest position with said liquid at said normal-fill level, said float adapted to be buoyed upwardly upon the liquid level rising above said normal-fill level to a predetermined overfill level, a float support guide sleeve mounted on the bottom wall portion of said sump, said float stem dimensioned for slidable reception in said sleeve, said sleeve operative for guiding said float substantially in a predetermined linear path perpendicular to the liquid surface, the improvement comprising; cam means adjacent the free end of said stem operative to engage said guide sleeve to establish a float maximum elevated position upon said float being buoyed upwardly by the liquid level increasing above said normal fill level to said overfill level, said cam means including first and second cam portions, an actuator engaging element movably mounted on said switch, said first cam portion contoured to contact said element when said liquid level in said sump is at or below said normal-fill level for moving said element to a first position holding said actuator in its circuit closing position allowing the opening of said fill valve at predetermined selected intervals by said sequence control means during said operational cycle to supply liquid to said chamber, upon the liquid rising to said overfill level said float being raised to said elevated position causing said first cam portion to be moved out of contact for moving said element, whereby said actuator is free to move to its circuit opening position shutting off additional liquid flow to said chamber while permitting said sequence control means to operate said dishwasher through the remainder of its operational cycle, and wherein the movement of said actuator to its circuit opening position being operative to move said element to a second position preventing downward movement of said float, upon completion of said operation cycle said float being manually rotatable in a predetermined direction relative to said float support guide sleeve causing said second cam portion to contact said element and move same to its first position resulting in downward movement of said float to its first lower rest position, and whereby by virtue of said float being in said first lower rest position said element is again contacted by said first cam portion causing said actuator to be held in said second position closing said circuit to said valve.

4,180,086

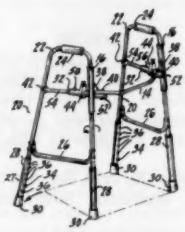
HYPEREXTENDIBLE WALKER

Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.

Filed Aug. 31, 1978, Ser. No. 938,706

Int. Cl.[2] F16M *13/08*

U.S. Cl. 135—67 **10 Claims**



1. A hyperextendible walker apparatus comprising:

a first U-shaped side frame including a first front leg and a first rear leg;

a second U-shaped side frame including a second front leg and a second rear leg;

a crossed brace means for connecting said first and second U-shaped side frames together, said cross brace means being rotatably connected to said first and second front legs respectively;

a pair of normal open position locking means connected to said cross brace means and to said first and second U-shaped side frames respectively for locking said side frames in a normal open first position with respect to said cross brace means; and,

a hyperextendible locking means forming part of said normal position locking means for locking at least one of said side frames in a hyperextended second position which position is extended at least 10° more open than the same side frame when in the normal open first position.

4,180,087

AUTOMATIC CONTROL FOR AN ADJUSTABLE MEMBER

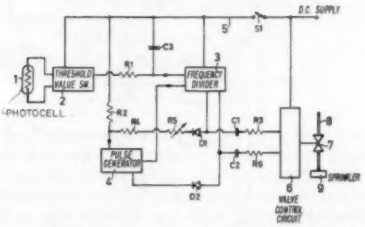
Alfred Meisner, and Erich Gerum, both of Nuremberg, Fed. Rep. of Germany, assignors to Firma DIEHL, Nuremberg, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,740

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632994

Int. Cl.[2] **A01G** *25/16;* **H01J** *39/12*

U.S. Cl. 137—78 **13 Claims**



10. A switching arrangement for control of a valve in an automatic sprinkling system comprising:

a light sensitive switching means for delivering an enabling signal at dusk;

a delay circuit means for receiving an enabling signal from the light sensitive switching means and delivering an actuating signal a predetermined delay period after receipt of the enabling signal;

a control circuit for control of the valve, said control circuit receiving said actuating signal from the delay circuit means to open the valve; and

a switching circuit, responsive to the actuating signal, for establishing an input signal to the delay circuit means which causes the delay circuit means to transmit a deactuating signal to the control circuit to close the valve a predetermined actuation period after receipt of the actuating signal by the control circuit.

4,180,088

WATER SHUTOFF SYSTEM

Raymond H. Mallett, P.O. Box 479, Meeker, Colo. 81641

Filed Dec. 5, 1977, Ser. No. 857,085

Int. Cl.[2] **F16K** *31/02*

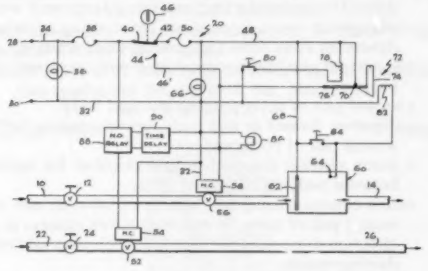
U.S. Cl. 137—87 **7 Claims**

1. A shutoff system for shutting off a fluid line in response to fluid flow through the line, said shutoff system comprising:

a normally closed electrically controlled valve for connection into the fluid line so that, upon non-energization and closing of said valve, fluid flow through the fluid line is prevented, and upon energization of said valve, said valve is opened in response to an electrical signal;

fluid flow sensing means for serial connection in the fluid line with said valve for sensing fluid flow, said sensing means producing an electrical signal in response to fluid flow through said sensing means; and

an electrical circuit having an automatic line, said automatic line interconnecting said sensing means and said valve, said automatic line having a latching relay connected to said sensing means and said valve so that when said latching relay is closed energization of said automatic line puts said automatic line in automatic mode so that the sensing of fluid flow by said fluid flow sensor causes unlatching of said latching relay and closing of said valve, said circuit also having a function line connected to said valve so that when said function line is energized by said circuit the sensing of fluid flow does not cause valve closing.



4,180,089

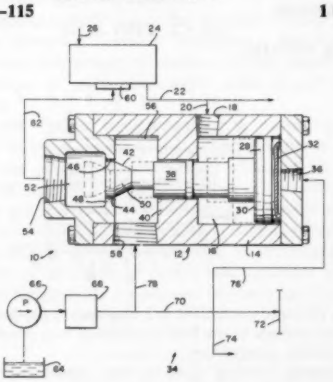
THRUST PISTON BIASING MEANS

Paul D. Webb, Tioga, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 30, 1977, Ser. No. 838,074

Int. Cl.[2] **G05D** *11/00*

U.S. Cl. 137—115 **1 Claim**



1. Means for controllingly biasing a thrust piston with oil pressure comprising:

a source of oil under pressure;

means for conducting oil from said source to a thrust piston for pressure biasing thereof;

pneumatic means coupled to said oil conducting means operative for attenuating the pressure of said oil; and

means coupled to said pressure-attenuating, pneumatic means for operating the latter; wherein

said pressure-attenuating, pneumatic means comprises means for shunting pressured oil away from said oil-conducting means;

said oil-conducting means comprises a first conduit; and

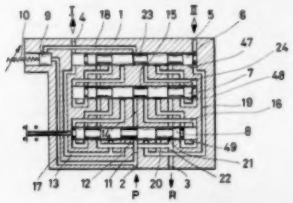
said pressure-attenuating, pnuematic means comprises a second conduit communicating with said first conduit for shunting pressured oil away from said first conduit; further including

a valve body;
a pair of ports opening into said body;
a passageway, formed in said body, communicating said pair of ports; and
a metering element movably disposed in said passageway for opening and constricting said passageway to oil conduct between said pair of ports said metering element being defined by an annular land providing a clearance with said passageway and a tapered surface tapering to its smaller dimension away from said annular land; wherein
said second conduit communicates with one port of said pair;
a second pair of ports opening into said body;
a chamber, formed in said body, communicating with said second pair of ports; and
a piston element disposed in said chamber for movement between said second pair of ports;
means communicating said source of oil with one of said second pair of ports, to urge said piston element in a first direction to increase the shunting of oil from said oil-conducting means;
a source of modulating pneumatic pressure;
means communicating said pneumatic pressure source with the other port of said second pair thereof, to urge said piston element in a second direction counter to said first direction to decrease the shunting of oil from said oil-conducting means; and
means coupling said piston element to said metering element.

4,180,090
4/2 WAY VALVE

Siegfried Bemba, Rommerskirchen, Fed. Rep. of Germany, assignor to De Limon Fluhme GmbH & Co., Dusseldorf, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,614
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646290
Int. Cl.[2] F16N *25/02*
U.S. Cl. 137—119 **14 Claims**

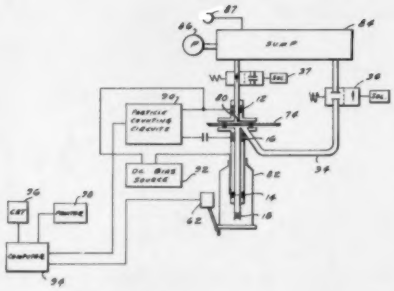


1. A pressure controlled 4/2 way valve, particularly for the alternate control of the feed conduits of two conduit—lubrication systems, comprising
a housing forming three at least substantially cylindrical spaces and a plurality of channels connecting said cylindrical spaces with one another,
a piston displaceably mounted in each of said three cylindrical spaces between two end positions of said piston, respectively, said pistons constituting means for the automatic control of a flow medium flowing through said channels and portions of said cylindrical spaces, one of said pistons constituting a control piston disposed in a first of said cylindrical spaces, another of said pistons constituting an auxiliary control piston disposed in a second of said cylindrical spaces, and a third of said pistons constituting a reception piston disposed in a third of said cylindrical spaces,
a first feed conduit connection and a second feed conduit connection communicating on both ends, respectively, of said third cylindrical space for said reception piston and adapted to be connected to a first and a second feed conduit, respectively,
a pressurized conduit connection communicating with said channels and adapted to be connected to a pressurized line,
a pressure relief valve means for hydraulic precontrol being disposed in one of said channels in a path of flow between said pressurized conduit connection and said third cylindrical space for said reception piston,
said channels include at least two end channels respectively constituting through-flow passages communicating on different sides with each end of each said cylindrical spaces adjacent the respective ends of said pistons, whereby said pistons are supplied on one side and exhausted on the other side of said cylindrical spaces respectively through said two end channels respectively.

4,180,091
PURGING MEANS FOR APERTURE OF BLOOD CELL COUNTER

John P. Hanley, West Paterson; Pasquale M. Petrucci, Morristown, and Stanley Pfeifer, Mendham, all of N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Nov. 18, 1977, Ser. No. 852,953
Int. Cl.[2] G01N *27/00*
U.S. Cl. 137—238 **10 Claims**



1. A purge system for a blood cell counter of the type including a support structure with an aperture therein positioned between sensing electrodes which detect the passage of a cell through said aperture, comprising:
a housing assembly;
a first conduit within said housing assembly having a downstream end terminating at an outer wall thereof;
an aperture and supporting structure therefor positioned near said downstream end of said first conduit, there being a gap defined between said supporting structure and said outer wall of said housing assembly, said aperture and said gap being in fluid communication with each other;
a second conduit in fluid communication with said gap such that a fluid is able to flow radially outwardly from said first conduit, through said gap, and into said second conduit, said first conduit and said second conduit both having relatively large cross-sectional areas in comparison with that of said gap such that the pressure drop per unit length of a liquid flowing through said conduits is less than the pressure drop per unit length of a liquid flowing through said gap;
a third conduit having an end terminating near said aperture and in fluid communication therewith, said terminal end of said third conduit positioned on the opposite side of said aperture and said support structure from said first conduit and adapted to receive liquid flowing through said aperture; and
means for applying negative pressure to said second conduit, whereby a relatively high velocity liquid stream may be provided within said gap and adjacent the upstream side of said aperture when negative pressure is applied to said

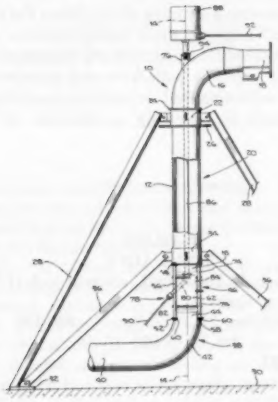
second conduit, said stream being able to effectively flush debris into said second conduit.

4,180,092

CENTER PIVOT CONSTRUCTION FOR CENTER PIVOT SPRINKLER

Richard E. Hunter, Greeley, and Robert C. Shook, Kersey, both of Colo., assignors to Irrigation & Power Equipment, Inc., Greeley, Colo.

Filed Mar. 23, 1978, Ser. No. 889,224
Int. Cl.[2] B05B *3/12*; F16L *21/00*
U.S. Cl. 137—344 **13 Claims**



1. In a self-propelled center pivot irrigation system having one or more span units rotating about a center pivot on one or more wheeled power frames wherein the center pivot includes gasket means for allowing leak-proof rotation of a vertical pipe about an axis common to a fixed pipe supplying liquid under pressure to the rotating pipe, the improved center pivot comprising:

(a) a first pipe connectable on one end to a rotating span unit and terminating on the other end in a cylindrical segment;

(b) bearing and support means for rotatably holding said cylindrical segment of said first pipe concentric with a vertical axis of rotation;

(c) a second pipe connectable on one end to a source of liquid under pressure and terminating on the other end in a cylindrical segment;

(d) first spacer means connected between said bearing and support means and said second pipe for holding said cylindrical segment of said second pipe in concentric facings spaced relationship with said cylindrical segment of said first pipe;

(e) a casing adapted to mate in concentric sliding relationship with said cylindrical segment of said second pipe on one end and with said cylindrical segment of said first pipe on the other end, said first and second pipes being so spaced by said first spacer means and said cylindrical casing being of a length such that in a first position said casing is in overlapped mating relationship with both said first pipe and said second pipe, in a second position said casing is in overlapped mating relationship with said first pipe and in spaced end to end relationship with said second pipe, and in a third position said casing is in overlapped mating relationship with said second pipe and in spaced end to end relationship with said first pipe, said casing being slideable along said axis of rotation between said first, second and third positions;

(f) means for releasably holding said casing in said first position;

(g) a first gasket disposed between the overlapping surfaces of said casing and said first pipe; and,

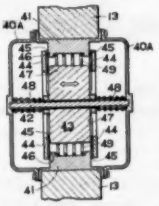
(h) a second gasket disposed between the overlapping surfaces of said casing and said second pipe.

4,180,093

AIR PRESSURE CONTROL APPARATUS FOR A HOT OR COLD STORAGE CHAMBER

Masaaki Kamezaki, Tokyo, Japan, assignor to Taisei Kosan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 717,346, Aug. 24, 1976, Pat. No. 4,116,213.
This application Jul. 18, 1978, Ser. No. 925,771
Int. Cl.[2] F16K *17/18*
U.S. Cl. 137—360 **3 Claims**



1. An air pressure control apparatus for a hot or cold storage chamber which comprises:

a damper disposed in a window provided in a panel or wall of said storage chamber defining an air passage around a periphery of said damper for ventilating air within said storage chamber therethrough;

a shaft extending horizontally within said window slidably supporting said damper along said shaft so as to be slidable both inwardly and outwardly in response to variation of air pressure within said chamber;

first and second slidable frames for airtightly closing said air passage extending thereover mounted on said shaft and contacting with peripheral surfaces of said window and said damper at inside and outside walls of said storage chamber;

wherein said frames have openings at central portions thereof through which said damper is exposed to the inside and outside of said storage chamber and being moveable together with said damper, whereby said damper and one of said frames may be shiftable either in an inside or outside direction of said chamber releasing the airtight sealing of said air passage in accordance with variation of air pressure within said chamber so as to establish air pressure equilibrium between the inside and outside of said chamber.

4,180,094

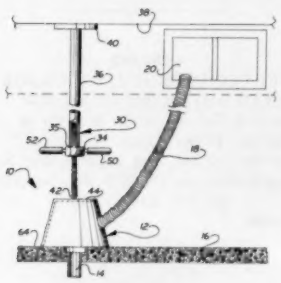
DRAIN COVER ASSEMBLY

Steve Viragh, 11716 Cromwell, Cleveland, Ohio 44120

Filed May 24, 1978, Ser. No. 909,113
Int. Cl.[2] E03F *5/12*; A47K *1/14*
U.S. Cl. 137—362 **4 Claims**

1. A drain cover assembly for use in venting a below grade floor drain under a building structure, said assembly comprising a hollow drain cap having a bottom rim dimensioned to cover the drain, resilient seal means for disposition between said rim and the floor surrounding the drain, a nipple extending from said cap and communicating with the hollow interior of said cap, flexible conduit means coupled to said nipple for conducting water from the hollow interior of said cap to a remote location, a jack screw having a threaded arm telescopically movable in a tubular shaft, a nut coacting between the one end of the shaft and the threaded arm for telescopically

moving the arm relative to the tubular shaft, and a load distributing plate at the free end of the shaft for engagement with the



overlying building structure, the free end of the threaded arm being disposed in abutting engagement with the top of said cap.

4,180,095

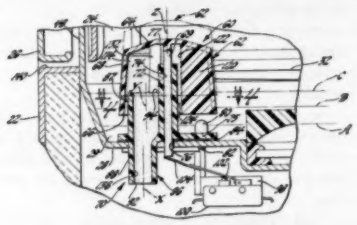
DISHWASHER FLOAT SWITCH CONTROL ASSEMBLY

James M. Woolley, Dayton, and Jon F. Berges, Waynesville, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 853,318, Nov. 21, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,210

Int. Cl.[2] F16K *31/18*

U.S. Cl. 137—387 **2 Claims**



1. In combination with a dishwasher including a dishwashing chamber having a bottom wall portion forming a sump, fill valve means for filling said sump with liquid to a predetermined surface level, and means for circulating said liquid in said chamber, a switch assembly operatively connected to an electrical control circuit of the dishwasher, a float assembly for said fill valve means including a float adapted to float adjacent the surface of said liquid, a float support guide sleeve mounted on the bottom wall portion of said sump, said float having an elongated central stem extending on the principal axis of said float and dimensioned for slidable reception in said sleeve, said sleeve operative for guiding said float substantially in a predetermined linear path perpendicular to said liquid surface as the level of said liquid surface increases to said predetermined surface level, the improvement wherein said float support guide sleeve includes a hollow standpipe having upper and lower interconnected portions, said upper portion being partially defined by an external wall of said guide sleeve along a part of the axial height of said sleeve above said bottom wall portion, said standpipe lower portion formed on a vertical axis offset radially outwardly from the axis of said standpipe upper portion, said standpipe lower portion having its bottom open end located below said bottom wall portion and its upper open end located at a predetermined height above said predetermined surface level, said float in the form of an inverted cup including a closed top, a downwardly facing open bottom and a side wall; switch actuator means engaged with the free end of said stem operating said switch means as said float rises and falls with variations in the liquid level in said sump, wall sections depending from the closed top of said float intermediate said stem and float side wall dividing said float into a pair of opposed unequal sized cavities and a pair of opposed equal sized cavities, both of said equal sized cavities and one of said unequal sized cavities adapted to entrap air to provide buoyancy for said float, the other of said unequal sized cavities defining a combined float-damping and overflow cavity of a predetermined size to telescopically receive therein the upper portion of said hollow standpipe, said standpipe upper open end positioned at a predetermined height below said sleeve upper open end and about said predetermined liquid surface level, whereby under normal conditions said standpipe establishes an air-break path between said overflow cavity and atmosphere to provide a damping effect during the rise and fall of said float, and whereby upon liquid overflow conditions existing in said dishwashing chamber said standpipe provides a concealed liquid overflow path from said chamber allowing overflow liquid to be directed to a predetermined disposal area to obviate damage to operating components of said dishwasher.

4,180,096

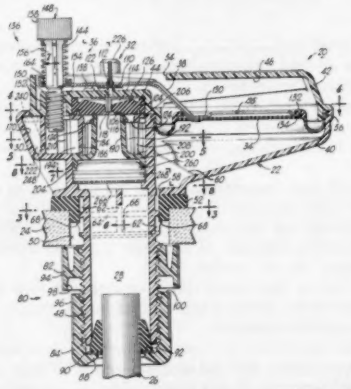
FILL VALVE

Dwight N. Johnson, El Toro, Calif., assignor to J. H. Industries, Inc., Santa Ana, Calif.

Filed Jun. 23, 1977, Ser. No. 809,382

Int. Cl.[2] F16K *31/34*

U.S. Cl. 137—403 **25 Claims**



1. A valve assembly for controlling the liquid level in a tank and comprising in combination:

a housing including an inlet and an outlet;

a flow path in said housing between said inlet and outlet;

a valve including a valve member and a valve seat along said flow path, said valve member and seat being movable relative to one another between open and closed positions;

sensing means for detecting the level of liquid in said tank;

valve operating means coupled between said sensing means and said valve for opening said valve in response to liquid level changes to enable flow along said flow path; and

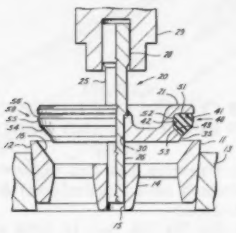
a flow impedance means formed in said flow path for dissipating fluid pressure along said flow path while minimizing fluid velocity increases;

said impedance means comprising a portion of said flow path between said valve and said outlet including spaced inner and outer interfacing walls curvilinear about said valve, said walls having a plurality of intermeshing baffles defining a series of sharp turns in said flow path portion.

4,180,097
MUD PUMP VALVE

James G. Sjoberg, Humble, Tex., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Nov. 2, 1978, Ser. No. 957,105
Int. Cl.[2] F16K *15/06, 1/38*
U.S. Cl. 137—516.29 **2 Claims**



1. A mud pump valve, which comprises:

a seat ring adapted for insertion in said mud pump, said seat ring including an upwardly facing frustro-conical seating surface on the interior thereof;

a generally flat closure disc having a downwardly facing frustro-conical seating surface at the lower end thereof, said seating surface being engageable with said seating surface of said seat ring, said closure disc also having a groove around the periphery thereof above said seating surface thereof, said groove having a cross-section which includes a flat first side substantially parallel to the plane of said disc, a flat second side at a right angle to and extending downwardly from said first side, and a flat third side adjacent and at an angle greater than 90° to said second side and adjacent to said seating surface of said disc;

and an insert ring contained within said groove, said insert ring having a cross-section which includes a flat first side substantially parallel to the plane thereof and of a width less than the width of said first side of said groove, a flat second side adjacent and at a right angle to said first side and of a width equal to said second side of said groove, and a flat third side adjacent and at an angle greater than 90° to said second side and of a width equal to said third side of said groove, and said cross-section of said insert ring further including a fourth side adjacent to said third side of said insert, said fourth side also being adjacent to said seating surface of said disc and extending outwardly and upwardly at an angle greater than that of said seating surface, wherein the cross-sectional area of said insert ring is sized such that no part thereof is extruded outwardly of said first side of said groove;

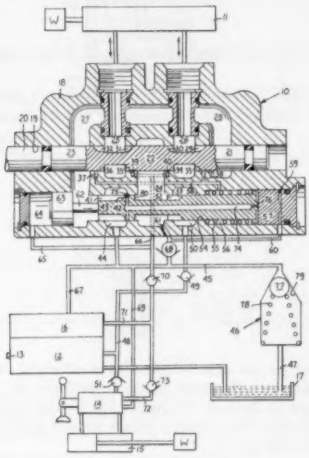
and means for mounting said disc for reciprocal motion with respect to said seat ring between an open position and a closed position.

4,180,098
LOAD RESPONSIVE FLUID CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 773,421, Feb. 28, 1977, Pat. No. 4,122,865, and a continuation-in-part of Ser. No. 655,561, Feb. 5, 1976, Pat. No. 4,099,379. This application May 12, 1978, Ser. No. 905,331
Int. Cl.[2] F15B *13/08*
U.S. Cl. 137—596.13 **18 Claims**

1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid exhaust means, first variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said load chambers and said fluid exhaust means, second valve means having first fluid throttling means between said fluid inlet chamber and said fluid supply chamber, second fluid throttling means between said load chambers and said fluid exhaust means, and sequencing means connecting said first fluid throttling means and said second fluid throttling



means, first control means of said second valve means responsive to pressure differential across said first variable orifice means and operable to maintain said pressure differential across said first variable orifice means at a relatively constant level, and second control means of said second valve means responsive to pressure differential across said second variable orifice means and operable to maintain said pressure differential across said second variable orifice means at a relatively constant level.

4,180,099
FLUID FLOW CONTROLLER

Donald J. Moore, 442 W. 15th, Eugene, Oreg. 97401

Filed Aug. 8, 1977, Ser. No. 822,411
Int. Cl.[2] F16K *31/528*
U.S. Cl. 137—624.2 **7 Claims**

1. A controller for the flow of fluid under pressure, comprising:

(a) a base,

(b) a hollow housing on the base defining a fluid inlet passageway having upstream and downstream end sections of equal diameter and an intermediate section of larger diameter, the upstream end section being arranged for communication with a source of fluid under pressure and the downstream end section being arranged for communication with a fluid pressure outlet,

(c) a piston valve reciprocative in the inlet passageway and dimensioned for fluid sealing engagement with said upstream and downstream end sections and for fluid passage around the valve when in said intermediate section,

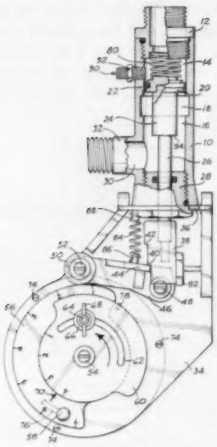
(d) a piston rod extending through the housing, and

(e) timer-controlled drive means on the base engaging the outer end of the piston rod for moving the piston sequentially from the upstream section of the inlet passageway to the intermediate section thereof and thence to the downstream section, the timer-controlled drive means comprising:

(1) a stepped stop lock on the outer end of the piston rod providing a plurality of longitudinally spaced shoulders,

(2) a cam follower lever mounted pivotally on the base,

(3) a cam follower on the lever,
(4) cam means mounted on the base for movement relative to the cam follower for effecting pivoting of the cam follower lever,



(5) a catch on the cam follower lever arranged to engage the shoulders on the stop block selectively in response to pivoting of the cam follower lever by the cam means, and
(6) timer-controlled power means engaging the cam means for moving the latter.

4,180,100

CONTROL VALVE HAVING A LOW NOISE THROTTLING DEVICE

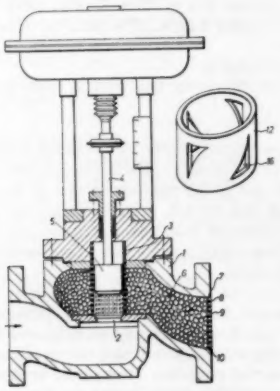
Fritz Kolb, Odenthal; Silvan Fehlisch; Otto Ziegert, both of Dormagen; Hans Bender, Mannheim, and Manfred Schmitt, Boenheim-Roxheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,614

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623078

Int. Cl.[2] F16K *47/08*

U.S. Cl. 137—625.3 **2 Claims**



1. A control valve comprising a valve housing having a fluid inlet and a fluid outlet, a perforated cylindrical hollow body arranged centrally in the housing downstream of the inlet, a closure element disposed in the hollow body, regulating means for displacing the closure element, and a mass of small fluid-flow resisting bodies irregularly situated around the cylindrical hollow body and completely filling the inside of the housing around the hollow body and between the fluid inlet and the fluid outlet, wherein said bodies are unconnected sections of pipe having walls perforated with triangular apertures.

4,180,101

DEVICE FOR CLOSING-OFF THE SPACE DEFINED BETWEEN AN INNER PIPE AND AN OUTER SHIELD TUBE

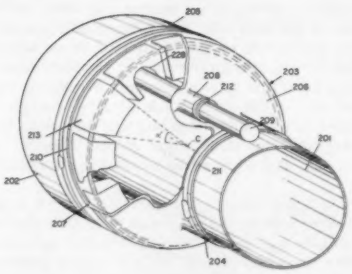
Heinrich Wegge, Tegernsee, Fed. Rep. of Germany, assignor to Wegurit Gesellschaft mbH Pipelinebedarf & Co., Tegernsee, Fed. Rep. of Germany

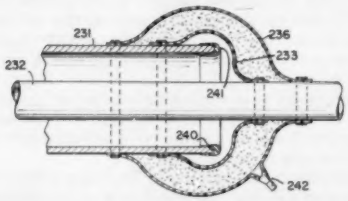
Division of Ser. No. 751,783, Dec. 16, 1976, abandoned. This application Dec. 28, 1977, Ser. No. 865,154

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 7540266[U]

Int. Cl.[2] F16L *57/00, 58/00*

U.S. Cl. 138—103 **9 Claims**





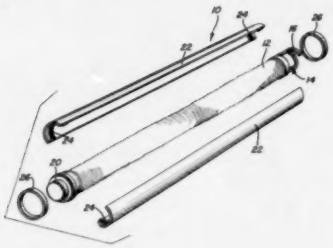
1. In combination, a pipe for conveying a product, a shield tube in which the pipe may be inserted with clearance, angle plates each having an axial portion extending over the exterior of the shield tube at one end thereof and a radial portion extending in use at least part of the way from said axial portion across said clearance between the shield tube and the pipe, and a sealing device for sealing the clearance between the pipe and the shield tube at said one end of the shield tube, the sealing device comprising a sleeve of flexible resilient material having a first end portion whose internal diameter is substantially equal to the external diameter of the pipe, a second end portion whose internal diameter is substantially equal to the external diameter of the shield tube, and an intermediate portion of substantially frusto-conical form joining the first and second end portions, and the sleeve also having a tubular appendix which is joined to the intermediate portion of the sleeve and extends in use substantially parallel to the axes of the pipe and shield tube for accommodating a signal-transmitting cable.

4,180,102

SEWER CONNECTOR

Derek J. Larkin, 1541 Morene Way, Modesto, Calif. 95355

Filed Dec. 14, 1978, Ser. No. 970,868
Int. Cl.[2] B65D *59/04*
U.S. Cl. 138—106 **7 Claims**



1. A connector device comprising in combination:

a flexible hose for carrying fluids therethrough, said hose being axially compressible and expandable for changing the working length of said hose; and

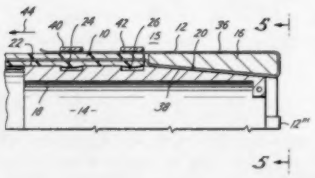
a housing comprising a pair of substantially semi-cylindrical housing halves for surrounding and protecting said hose, each housing half have a length which is substantially less than the extended length of said hose, engagement means disposed within and connected to said housing for engaging the outer periphery of said hose without causing injury to said hose by contact therewith, attachment means for providing a connection between the two housing halves for forming a firm engagement about said hose and forcing said engagement means into contact with said hose.

4,180,103

TERMINATION FIXTURE FOR A MARINE SEISMIC STREAMER CABLE

John C. Mollere, Nassau Bay, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Sep. 7, 1978, Ser. No. 940,420
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—109 **2 Claims**



1. A termination fixture for a seismic marine streamer cable section that is to be towed underwater, said cable section being in the form of an elongated tubular plastic jacket for containing a plurality of hydrophones and electrical conductors, the jacket being reinforced along its length by a plurality of tapes braided from plastic fibers of high tensile strength that are embedded in the wall of said jacket, short lengths of said tapes being exposed by stripping away a part of the wall of the plastic jacket at an end thereof, the termination fixture comprising:

a cylindrical bulkhead having inner and outer walls, a first portion of said outer wall having a smooth inwardly tapered surface and a second portion of said outer wall being untapered, the untapered portion having a diameter to fit snugly inside an end portion of said jacket;

a cylindrical wedge for gripping the exposed lengths of said tapes between the tapered portion of said bulkhead and the interior of said cylindrical wedge;

said cylindrical wedge being a collar having an outer wall and a smoothly tapered inner wall that is mateable with the tapered outer wall portion of said bulkhead; and

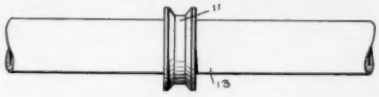
means for doubling back said exposed lengths of said tapes over the outer wall of said collar and means for externally binding said doubled-back tapes and the end portion of said jacket to the untapered outer wall portion of said bulkhead.

4,180,104

OUT OF CONTACT HIGHLY GEOMETRICAL CRACK ARRESTOR

Donald M. Park, Calgary, Canada, and Robert J. Eiber, Columbus, Ohio, assignors to Northern Border Pipeline Company, Kansas City, Mo.

Filed Sep. 26, 1977, Ser. No. 836,358
Int. Cl.[2] F16L *9/14*
U.S. Cl. 138—172 **7 Claims**



1. A method for reducing the extent of propagation of ductile fractures in a pressurized fluid pipeline of a type that undergoes expansion when the pressure of the fluid is increased from atmospheric to operating pressures comprising

(a) Forming one or more crack arresting bands having a non-convex polygonal rim cross-section and an approximately circular axial inner cross-section, and

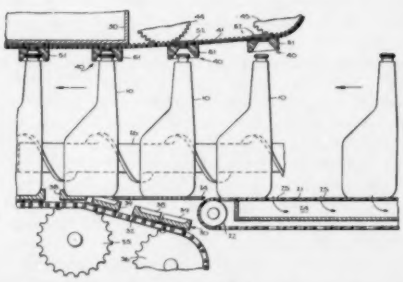
(b) placing one or more of said crack arresting bands at intervals along the pipeline so that each encircles the pipeline, wherein the spacing between the pipeline and the arrestor is 1½ to 20 times the expansion of the pipeline due to the pressure of the contents of the pipeline at operating pressure.

4,180,105

ARTICLE INFLATING SYSTEM

Albert J. Harvey, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,370
Int. Cl.[2] B65B *57/02;* **B65C** *3/26;* **B65B** *31/02*
U.S. Cl. 141—165 **12 Claims**



1. An article inflating system adapted to engage and inflate an open ended article being decorated at a decorating station which comprises

an air manifold for providing an air supply at a predetermined pressure suitable for inflating said article;

an endless belt disposed so as to pass in operative engage-

ment with said air manifold and having a plurality of spaced openings therein;

means for driving said endless belt;

a plurality of cup-shaped nozzles fastened to said endless belt, each of said nozzles having an opening extending therethrough and an article engaging surface to facilitate a sealing relationship with the open end of the article to be decorated; and

means for engaging said opening with said air manifold at the decorating station to facilitate the inflation of said article being decorated.

4,180,106

DEVICE FOR DISPENSING MEASURED QUANTITIES OF A LIQUID FROM A BOTTLE

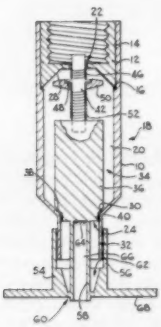
John C. Coetzee, P.O. Box 66160, Broadway, 2020, South Africa

Filed Sep. 5, 1978, Ser. No. 939,738

Claims priority, application South Africa, Sep. 6, 1977, 77/5345; Jul. 20, 1978, 78/4140

Int. Cl.[2] B65B *3/06*

U.S. Cl. 141—294 **16 Claims**



1. A dispensing and metering device comprising

attachment means for securing the device to the neck of a bottle;

a housing defining a chamber;

an inlet into said chamber adjacent said attachment means whereby the chamber can be filled through the inlet with liquid from a bottle secured to the device by the attachment means;

an outlet from the chamber whereby the chamber can be drained through the outlet;

valve means including first sealing means, second sealing means and an outlet nozzle means extending generally away from the outlet towards a bottom end furthest from the outlet and movable to control operation of said first and second sealing means;

the valve means being movable from a first condition in which said first sealing means closes the inlet and the outlet is open, through a second condition in which said first sealing means closes the inlet and the second sealing means closes the outlet, to a third condition in which at least said second sealing means closes the outlet and the inlet is open;

a liquid flow path defined at least partly by said outlet nozzle means through which path liquid from said chamber will primarily flow;

an air flow path defined at least partly within the outlet nozzle means and opening towards the bottom end of said outlet nozzle means for introducing air into the chamber via the outlet nozzle means and the outlet to replace liquid flowing from the outlet through the liquid flow path when the outlet is open; and

resilient means disposed within said housing and biasing the valve means resiliently to the third condition.

4,180,107

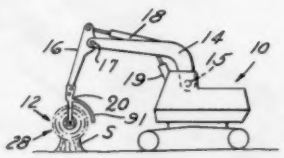
STUMP ERADICATOR

Ross D. Grover, Crystal, Mich., assignor to Ram Industries, Inc., Northville, Mich.

Continuation-in-part of Ser. No. 585,459, Jun. 10, 1975, Pat. No. 4,041,996. This application Jul. 14, 1977, Ser. No. 815,723

Int. Cl.[2] B27C *9/00*

U.S. Cl. 144—2 N **7 Claims**



1. Apparatus for eradicating tree stumps and the like comprising an axially rotatable drum, means supporting said drum for rotation and means for rotating said drum, a plurality of cutter teeth on the periphery of said drum adapted to cut wood fiber material, and a plurality of chipper teeth on the periphery of said drum adapted to hog out wood fiber material, both said cutter teeth and said chipper teeth projecting radially outwardly from said drum and having heads at their radially outer extremities, the heads of said teeth having cutting faces facing in the direction of intended drum rotation, the cutting faces of the heads of said cutter teeth having portions which are narrower than and project radially outwardly farther than the cutting faces of said chipper teeth.

4,180,108

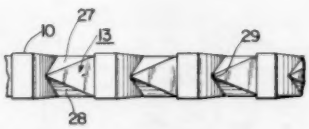
REMOVABLE MOUNTED TEETH IN BRUSH CLEARING SAW

Ralph E. Dove, Rte. No. 4, Sedalia, Mo. 65301

Filed Dec. 27, 1977, Ser. No. 864,741

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—34 F **2 Claims**



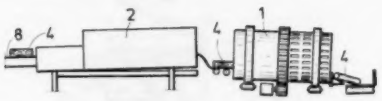
1. A saw blade assembly movable by a tractor as the tractor moves forward, comprising in combination, at least one substantially planar cutting assembly in the form of a blade having opposite surfaces and presenting a cutting edge, an attachment for holding the blade on the tractor front with the blade disposed horizontally to the ground with cutting edge outboard, a plurality of receptacle grooves disposed along and facing inboard on the cutting edge of said blade for receiving and supporting teeth therein, individual replaceable longitudinal teeth disposed and held snugly in said grooves along more than half of the their longitudinal length with the remainder of the tooth extending beyond the groove, and a space formed in the blade between adjacent said grooves by a bevelled portion of the blade adjacent the leading edge of the tooth whereat the blade contacts the leading tooth face at a reduced thickness apex portion thereby serving to produce a clearance channel in the blade body on both sides thereof carrying chips away from the spacing between the teeth by forces imposed during the forward motion of said tractor.

4,180,109

APPARATUS FOR TIMBER BARKING

Urho Heikkinen, Helsinki, Finland, assignor to Kone Osakeyhtio, Helsinki, Finland

Filed Oct. 6, 1977, Ser. No. 840,478
Claims priority, application Finland, Oct. 11, 1976, 762899
Int. Cl.[2] B27L *1/02*
U.S. Cl. 144—208 D **5 Claims**



1. In an apparatus for timber barking having a barking drum, timber bark pretreatment means adapted to receive and spot bark a plurality of timber pieces in their line of travel to said barking drum, conveying means for conveying said timber through said pretreatment means, said pretreatment means including patching means therein, the improvement which comprises:

said conveying means including a plurality of conveyors sequentially disposed along the longitudinal line of travel, one of said conveyors comprising a set of spreading and forwarding rolls having helices thereon, said spreading and forwarding rolls being adapted to spread longitudinally fed timber into the pretreatment means to form a uniform timber mat and to longitudinally advance said mat, a second conveyor comprised of a set of rotating rolls disposed at an angle to the longitudinal direction of timber travel for transporting the timber to said barking drum while at the same time rotating the same about their longitudinal axes.

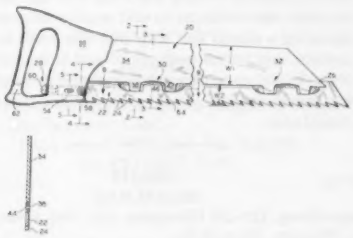
4,180,110

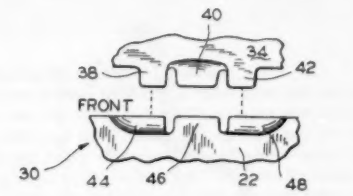
HANDSAW WITH SPECIALIZED CUTTING TEETH

Heinrich E. Tauscher, Bergstrasse 7, 8441 Furth-Oberalteich, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,589
Int. Cl.[2] B27B *21/00*
U.S. Cl. 145—31 R **11 Claims**

1. A handsaw comprising an elongated main blade means having one end shaped to form a first locking point which is no thicker than the main blade means and a handle at the other end, cutting blade means having a second locking point which is no thicker than the cutting blade at a first end, said second locking point being complementary to and fitting onto the first locking point, whereby said locking points pass freely through the kerf of the saw, clamp means on said handle for engaging a second end of said cutting blade means and drawing said cutting blade means taut between said locking point and said handle on said main blade, there being no longitudinal holding forces acting along the length of said blade between said locking point and said handle, and interlocking fingers on alternate sides of an edge of each of said main and cutting blade means along at least part of the length thereof, the fingers of one blade being sequentially, reversely positioned relative to the fingers of the other blade for preventing them from springing apart without effect upon the tautness of said cutting blade means, said interlocking fingers having only longitudinally spaced parallel contacting faces and reduced thicknesses so that the fingers on the main and cutting blade interfit face-to-face without wedging together, the combined cross-sectional thickness of said main and cutting blade means having the same cross-





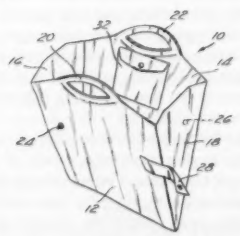
sectional thickness, whereby said combined blades follow their own kerf.

4,180,111

HANDBAG

Terri Davis, 4106 S. Harvard Blvd., Los Angeles, Calif. 90062

Filed Nov. 13, 1978, Ser. No. 959,925
Int. Cl.[2] A45C *3/04*
U.S. Cl. 150—1.7 **3 Claims**



1. A handbag comprising:

a thin sheet material front wall, said front wall having a first upper end and a first lower end;

a thin sheet material back wall, said back wall having a second upper end and a second lower end, said first lower end being secured to said second lower end;

a first side wall being integrally attached to an adjacent pair of sides of said front wall and said back wall;

a second side wall being integrally attached to the opposite adjacent pair of sides of said front wall and said back wall;

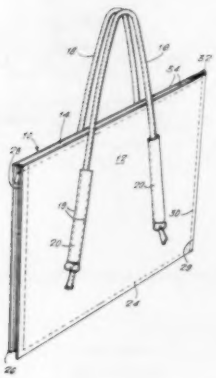
said front wall and said back wall and said side walls cooperating to form an enclosed container, said container assuming its largest size with said side walls being located sub-

stantially perpendicular to said front wall and said back wall, said container assuming a smaller size with said side walls being folded and located substantially parallel to said front wall and said back wall, releasable connecting means attached to both said front wall and said back wall to retain said container in said smaller size, said container assuming a closed size with said side walls in said folded position and lateral portions of said front and back walls being folded upon themselves and said releasable connecting means cooperating to retain the said container in said closed size.

4,180,112
BEACH BAG

Thomas Bovet, 221-226 Gloucester Rd., 13th Floor, Hyde Centre, Wanchai, Hong Kong

Filed Jan. 10, 1979, Ser. No. 2,169
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 7831317[U]
Int. Cl.[2] A45C *3/10*
U.S. Cl. 150—1.7 **5 Claims**



1. A bag comprising:

side panels each having opposite side edges and bottom edges, said panels being joined along said side and bottom edges,

carrying handles attached to said side panels,

releasable closure means for one side edge and said bottom edge of said side panels, said closure means closing the said one side edges and bottom edges of said panels when said bag is to function as a bag and being released when said bag is to function as a shield,

stiffening means for said other side edges of said side panels,

a triangular flap having three edges, two of said edges being joined to respective bottom edges of said side panels, and

an L-shaped reinforcing member for each said one side edge of said side panels, each reinforcing member having two arms, one arm of said member stiffening its respective one edge of said panel and the other arms stiffening a part of said third edge of said triangular flap.

4,180,113
HAMPER BAG COVER

Joel R. Liebling, 125 Hibiscus Dr., Rochester, N.Y. 14618

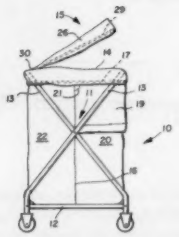
Filed Oct. 12, 1978, Ser. No. 950,865
Int. Cl.[2] B65D *29/00*
U.S. Cl. 150—7 **8 Claims**

1. A cover for a hamper bag supported on a hamper stand so a top opening of said hamper bag is held open around an upper region of said hamper stand by a top of said hamper bag being noosed around said upper region of said hamper stand, said cover comprising:

a. a cloth panel shaped to overlie said top opening and also fit around said upper region of said stand;

b. a cloth skirt extending downwardly from said panel around a perimeter of said panel to fit around the outside said upper region of said stand;

c. an elastic strip arranged around the bottom of said skirt



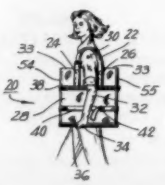
and dimensioned for stretching over and snapping in under said upper region of said stand for releasably holding said panel closed over said top opening of said hamper bag; and

d. said panel, said skirt, and said elastic strip all being secured to the inside of said hamper bag along a line spaced below said top of said hamper bag.

4,180,114
PORTFOLIO

Diane Katz, 251 W. 92nd St., New York, N.Y. 10025

Filed May 26, 1978, Ser. No. 909,612
Int. Cl.[2] A45C *3/00*
U.S. Cl. 150—28 R **29 Claims**



1. A flexible portfolio for flat planar objects such as works of art which comprises first and second substantially rectangular flexible panels, said panels being of substantially equal size and being in registration, means securing three edges of the first panel to the respective opposed three edges of the second panel, said three edges of each panel being two end edges and a middle edge, one end of each end edge being contiguous with an end of said middle edge, a zipper means, said zipper means having discrete first and second rectilinear stringers, said stringers being mateable when juxtaposed upon the deformation of the flexible panels into a cylindrical configuration, a first stringer of said zipper means being mounted to the first panel parallel to and spaced from the middle of said three edges of said first panel, a second stringer of said zipper means being mounted to the first panel by mounting means contiguous with the middle of said three edges of said first panel, and flexible linear strap means, said strap means being mounted to at least said first panel so that the portfolio is portable.

4,180,115

TIRE, TRACTION UNIT AND DEVICE FOR SHIFTING SAID TRACTION UNIT

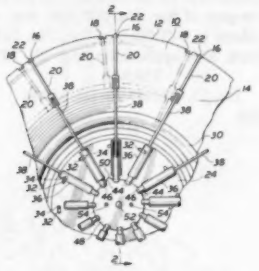
Kesao Yamagishi, 4-18, Chuo 3-Chome, Ueda City, Nagano Prefecture, Japan

Filed Mar. 29, 1977, Ser. No. 782,442

Claims priority, application Japan, May 21, 1976, 51/57910; Sep. 27, 1976, 51/114689

Int. Cl.² B60C *27/00, 27/02*

U.S. Cl. 152—216 **6 Claims**



1. A tire which comprises a plurality of pairs of shallow and deep channels provided in close proximity with each other around said tire to extend transversely from the side walls thereof toward a tread portion, said pairs of the shallow and deep channels being uniformly spaced at intervals around the periphery of said tire, said shallow channel being of substantially the same shape as the deep channels, said deep channels receiving a traction unit in its inoperative position, and said shallow channels for receiving the traction unit in its operative position.

4,180,116

RADIAL TIRES

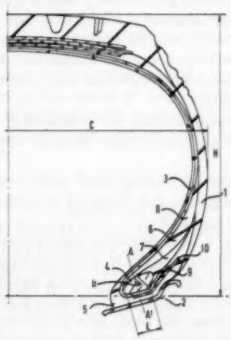
Luigi Maiocchi, Vernate - Fraz. Moncucco, Via Mazzini, 1 Milan, Italy

Filed Dec. 14, 1977, Ser. No. 860,573

Claims priority, application Italy, Dec. 20, 1976, 30602 A/76

Int. Cl.² B60C *15/04*

U.S. Cl. 152—362 R **5 Claims**



1. In a radial carcass tire having a section of a ratio H/C that is not greater than 0.7, and which is intended to be mounted onto a rim provided with bead-seats inclined at an angle of 15° with respect to the rotation axis, said tire presenting beads, each of which comprises a bead-wire core around which, from inside towards outside, the extremity of the carcass ply or plies is turned-up, said bead-wire cores being consitituted of rubberized metallic wires wound spirally to present a polygonal cross-section elongated in the axial direction, and in which the side constituting the bead-core base, is inclined at an angle of 15° with respect to the said rotation axis, the improvement wherein said polygonal cross-section has an irregular geometrical figure consisting of two associated polygons, said figure having its bary-center axially shifted to the outside, with respect to the line of the mid-plane of the bead-core base, between 7% and 30% of the axial width of the said bead-core base.

4,180,117

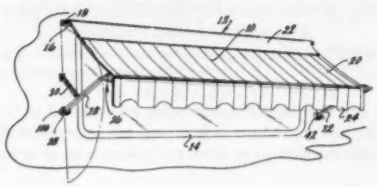
WINDOW AWNING

Bradley G. Greer, Long Beach, Calif., assignor to A & E Plastik Pak Co., Inc., Industry, Calif.

Filed Jun. 5, 1978, Ser. No. 912,190

Int. Cl.² E04F *10/06*

U.S. Cl. 160—67 **19 Claims**



1. An awning for a window, including,

a roll-up mechanism including a roller tube and an awning fabric, one end of the awning fabric being attached to the roller tube and then wound around the tube, the roll-up mechanism being constructed to provide tension in the awning fabric as the fabric is unrolled from the roller tube,

means for attaching the other end of the awning fabric above the window,

a pair of support arm assemblies each extending from an individual side of the window and coupled to an opposite end of the roll-up mechanism,

each assembly including,

a main support arm extending at one end from the side of the window and coupled at the other end to one end of the roll-up mechanism and rotatable through an angle of approximately 180° about the side of the window as a fulcrum,

a rafter arm extending at one end from the side of the window and rotatable through an angle of approximately 180° about the side of the window as a fulcrum and coupled at the other end to an associated one of the main support arms for sliding movement along the associated main support arm, during its rotation through an angle of approximately 180°, to a plurality of positions for providing different awning positions, and

means for locking the other end of the rafter arm to the main support arm at the individual ones of the different awning positions.

4,180,118

CORD LOCK MECHANISM FOR VENETIAN BLIND

Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

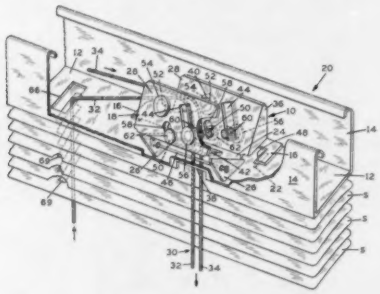
Filed Jul. 13, 1978, Ser. No. 924,309

Int. Cl.² E06B *9/38, 9/322*

U.S. Cl. 160—178 C **8 Claims**

1. A cord locking mechanism for a venetian blind comprising a lock housing, a flexible blind lifting and lowering member, a guide mounted in said housing for guiding said flexible member, a track in said housing, a locking pin mounted for movement in said track to and from a first position close to said guide and a second position remote from said guide, said flexible member extending between said guide and said locking pin, said pin when in said first position serving to grip said flexible member between said guide and said pin for preventing move-

ment of said flexible member in one direction, helper means mounted for movement in said housing toward and away from the second position of said pin for urging said flexible member into engagement with said pin when said pin is in said second



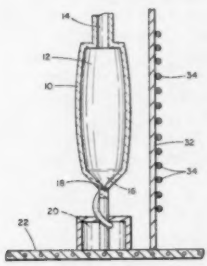
position and said helper means being so mounted as to move away from the second position of said pin upon movement of said flexible member away from said pin to raise or lower said blind.

4,180,119

MOLD FOR DIRECTIONALLY SOLIDIFIED SINGLE CRYSTAL CASTINGS AND METHOD FOR PREPARING SAME

Lamar Burd, Andover, and James K. Donnelly, Dover, both of N.J., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Sep. 18, 1978, Ser. No. 943,212
Int. Cl.[2] B22C *9/04*; B22D *25/06*
U.S. Cl. 164—34 **8 Claims**



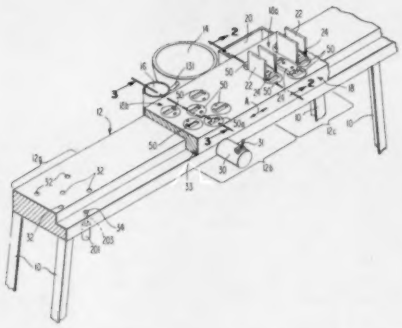
1. Apparatus for casting single crystal articles including a shell mold, a chill plate on which the shell mold is adapted to rest, said shell mold including one or more starter chambers at the lower end adapted to contact the chill plate, one or more mold cavities, each having an inlet at its upper end portion for the introduction of molten metal into the shell mold, and a helical passage communicating at its upper end with the mold cavity and extending downwardly to the starter chamber for selecting a single crystal to grow into the metal in the mold cavity during solidification, the improvement which comprises a rigid columnar support extending continuously alongside the helical passage down through the starter chamber.

4,180,120

CAST-ON METHOD AND APPARATUS FOR CASTING PARTS ONTO THE LUGS OF LEAD-ACID BATTERY PLATES STACKS

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 752,644, Dec. 20, 1976, which is a continuation-in-part of Ser. No. 880,017, Feb. 21, 1978, which is a division of Ser. No. 659,572, Feb. 19, 1976, Pat. No. 4,085,792, which is a continuation-in-part of Ser. No. 618,772, Oct. 2, 1975, Pat. No. 3,980,126, which is a continuation-in-part of Ser. No. 432,545, Jan. 11, 1974, Pat. No. 3,954,216, which is a continuation-in-part of Ser. No. 395,528, Sep. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,338, Sep. 28, 1971, abandoned. This application May 30, 1978, Ser. No. 910,944
Int. Cl.[2] B22D *19/00, 25/04*
U.S. Cl. 164—109 **37 Claims**



1. A cast-on apparatus for casting parts onto lugs of battery stacks, comprising:

(a) a base plate having at least one molten lead supply orifice defined therein at a casting portion defined therealong;

(b) a mold carriage means slidably engaging said base plate and having at least one work station formed therealong with at least one molding void defined through said carriage means at said work station, for selective movement of said work station into a position over said casting portion of said base plate, said position placing said molding void in fluid communication with said orifice said mold carriage means at said station comprising means for receiving said battery plate stacks for orienting at least a portion of said lugs within at least a portion of said molding void; and

(c) metal supply means for selectively supplying molten metal through said orifice to said void for casting said parts.

33. A method of casting lead parts onto the protruding positive and negative lug rows of a lead-acid battery stack comprising the steps of:

(a) providing a base plate having at least one molten lead supply orifice disposed in a top surface thereof;

(b) providing a mold carriage block having an undersurface which slidingly engages the top surface of said base plate;

(c) fitting at least one mold into a well defined through said mold carriage plate to define a mold cavity through said mold carriage plate;

(d) positioning said battery stack so at least a portion of one of the rows of said stack protrudes into at least a portion of said at least one mold cavity; and

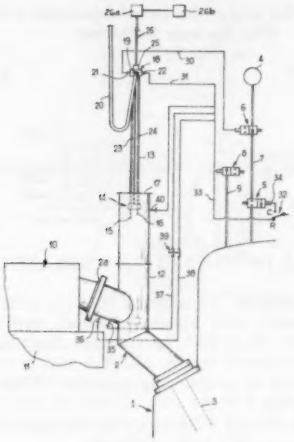
(e) sliding said mold carriage plate at least between a position wherein said mold cavity is aligned over said at least one orifice to receive molten lead introduced therefrom, and at least one other position wherein portions of said mold carriage block seals said orifice with respect to the atmosphere.

4,180,121

LOW PRESSURE MOLTEN METAL CASTING DEVICE

Jean H. Lefebvre, Chaville, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 16, 1978, Ser. No. 878,459
Claims priority, application France, Mar. 1, 1977, 77 05933
Int. Cl.[2] B22D *17/32, 17/06*
U.S. Cl. 164—152 **13 Claims**



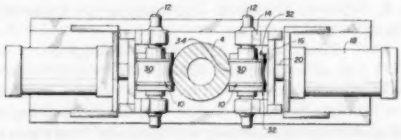
1. Device for casting low-pressure molten metal, which comprises a chamber provided with at least one inlet feed opening for at least one mould and a casting conduit connecting said chamber to a metal smelting furnace, said chamber being adapted to be connected in turn to a source of fluid under pressure for feeding molten metal to said chamber by raising the molten metal therein; a column disposed downstream of the furnace and upstream of said at least one inlet feed opening and extending upwards to a level higher than said chamber, said column constituting a buffer reservoir for the molten metal and a feed conduit for a neutral scavenging gas; and a level sensor provided in said column and adapted to co-act with means for controlling the molten metal pressure in the furnace in order to adjust a metallostatic pressure subordinate to a selected level, the level sensor being mounted for displacement down to a position lower than that of the at least one inlet feed opening, said level sensor being shifted at the end of a casting operation after venting fluid used for pressurizing the furnace and returning the metal to said furnace, in order to cause another rise of molten metal up to said lower position of the sensor before re-closing the at least one mould for a subsequent casting cycle.

4,180,122

COMPOSITE PINCH ROLL FOR CONTINUOUS VERTICAL CASTING

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed May 10, 1978, Ser. No. 904,471
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—448 **11 Claims**



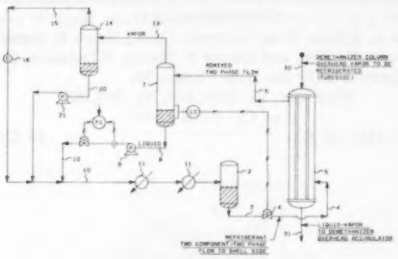
1. A pinch roll for use in a continuous vertical casting operation, the pinch roll comprising, a main body portion having a peripheral surface for engaging a bar to be cast, and a pair of opposite side portions removably fixed to the main body portion, each side portion having a peripheral bar contacting surface for engaging a bar in a double bar casting operation, said side portions each having a peripheral land located on one side of their peripheral bar contacting surfaces such that the distance between their peripheral bar contacting surfaces may be varied depending on whether the side portions are fixed to the main body portion in one position with the lands located adjacent the main body portion or in an alternative position, with the peripheral bar contacting surfaces located adjacent the main body portion.

4,180,123

MIXED-COMPONENT REFRIGERATION IN SHELL-TUBE EXCHANGER

Rolland E. Dixon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 14, 1977, Ser. No. 768,515
Int. Cl.[2] F28B *9/00*
U.S. Cl. 165—1 **11 Claims**



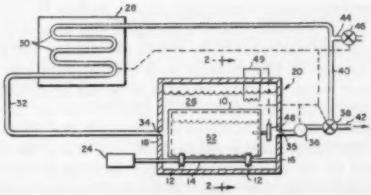
1. A method or operation for effecting heat exchange in a heat exchange zone between a liquid mixed-component material comprising under conditions of the operation a liquid component and a vapor or vapor-forming component and another fluid which comprises passing said material into and through said exchange zone in a manner, including a sufficiently rapid flow, to keep the portion of said zone through which said material is passed substantially completely liquid full, thereby preventing separation of a vapor phase which leaves behind, moving at a slower rate, if at all, a liquid which soon becomes ineffective for desirable heat exchange.

4,180,124

PROCESS AND APPARATUS FOR HEAT EXCHANGE

William A. Shurcliff, Cambridge, Mass., assignor to Broad Corporation, Boston, Mass.

Division of Ser. No. 735,418, Oct. 26, 1976, Pat. No. 4,117,882.
This application Jul. 21, 1978, Ser. No. 926,809
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—1 **12 Claims**



1. A process for storing thermal energy for subsequent use which comprises:

exposing a heat exchange liquid to heat to increase the thermal energy in said liquid,

passing the heated liquid into a first container in heat exchange relationship with a composition including a salt hydrate enclosed in at least one sealed container,

said salt hydrate having a heat of fusion of at least about 50 BTU/lb,

the volume ratio of the heat exchange liquid in said first container to salt hydrate being between about 1 to 20 and 2 to 1.

each sealed container being continually agitated to prevent or minimize supercooling and irreversible separation of said salt hydrate,

monitoring the pressure within at least one of said sealed containers thereby to determine the latent heat stored in the salt hydrate within said containers,

and periodically passing said heat exchange liquid from indirect heat exchange relationship with said salt hydrate to extract heat from said liquid.

4,180,125

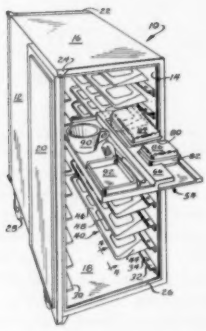
APPARATUS FOR SELECTIVELY HEATING AN INDIVIDUAL FOOD ITEM IN A REFRIGERATED ENVIRONMENT

William J. Schulz, West Cornwall, Conn.; Ralph R. Pecoraro, Jacksonville, Fla., and Gerard T. Hogan, Winchester, Conn., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 24, 1978, Ser. No. 889,763

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—48 R **11 Claims**



1. An apparatus for heating at least one covered container on a meal service tray while other items on the tray are refrigerated comprising an enclosed housing having a plurality of cooperative pairs of guide rails therein for supporting a first pair of opposed side edges of a plurality of trays; means for supplying a refrigerated atmosphere within said enclosure; a plurality of generally horizontal, thin, heater shelves extending from a side wall of said housing for less than one-half the width of the trays; a ramp surface on at least one end of each of said heater shelves; a plurality of trays, each of said trays having at least one pair of abutment portions integrally supported by said trays and extending transversely over a portion thereof relative to said first opposed pair of side edges, said abutment portions being located sufficiently far above the serving surface of the trays to permit end contact with said at least one covered container while allowing the trays to be slid along said cooperating pairs of guide rails so that said thin heater shelves will pass above the tray surfaces and beneath the abutment portions, the ramp surface on each of said heater shelves being adapted to lift a covered container located on said tray between said at least one pair of abutments and permit said heater shelf with which said container is frictionally engaged to pass under it as said container is restrained by one of said at least one pair of abutment portions.

4,180,126

AIR CONDITIONING APPARATUS AND METHOD

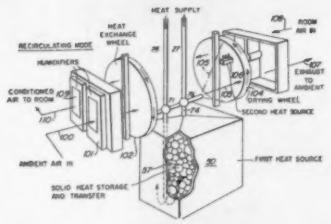
William F. Rush, Park Ridge; Jaroslav Wurm, N. Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 583,522, Jun. 4, 1975, Pat. No. 4,081,024, which is a continuation-in-part of Ser. No. 415,323, Nov. 13, 1973, Pat. No. 3,889,742. This application Mar. 21, 1978, Ser. No. 888,740

The portion of the term of this patent subsequent to Jun. 17, 1992, has been disclaimed.

Int. Cl.[2] F24F *7/00*

U.S. Cl. 165—59 **11 Claims**



1. An open-cycle air conditioning apparatus for heating and cooling comprising:

an enclosure defining a treatment air passageway and a separate regenerative air passageway;

means for passing an air stream through each of said passageways;

a sensible heat exchanger means for transfer of thermal energy from one of said passageways to the other;

a desiccant means for transfer of moisture from the air treatment passageway to the regenerative air passageway and spaced toward the exhaust of the regenerative air stream from said heat exchanger means;

a first evaporative cooling means near the exit of the conditioned air passageway and a second evaporative cooling means near the entrance of the regenerative air passageway;

a first heater means in the regenerative air passageway between said sensible heat exchanger means and said desiccant means supplying heat to the entire regenerative air stream;

a second heater means in the regenerative air passageway between said first heater means and said desiccant means supplying regeneration heat to a portion of the regenerative air stream previously heated by said first heater means; and

a heat collector means and conduit means providing heat to said first heater means.

4,180,127

MULTIPLE HEAT PIPE HEAT EXCHANGER AND METHOD FOR MAKING

Dale E. Maxson, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

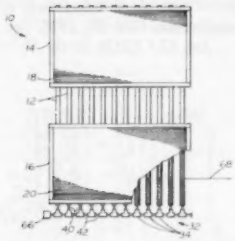
Filed Nov. 14, 1977, Ser. No. 850,865

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—76 **25 Claims**

1. A multiple heat pipe device adapted to be charged with heat transfer fluid comprising: a plurality of heat pipes having respective open ends and a header section comprising conduit means associated with said open ends, said conduit means comprising a plurality of looping tubes, each of said looping

tubes having one end inserted in one of said open ends and another end inserted in another of said open ends, at least one



of said open ends having at least two looping tube ends inserted therein.

4,180,128

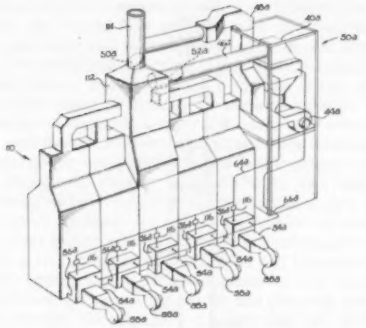
MULTIPLE FURNACE WASTE HEAT RECOVERY SYSTEM

John J. Fallon, Jr., 1330 Sugarloaf Dr., Pasadena, Calif. 91103; Joe B. Blair, Huntington Beach, Calif.; Donald R. Phelps, Glendale, Calif., and Robert P. Cabeen, III, Pasadena, Calif., assignors to John J. Fallon, Jr. and Donald Ritt, both of Sun Valley, Calif.

Division of Ser. No. 641,721, Dec. 18, 1975, Pat. No. 4,083,398. This application Jan. 16, 1978, Ser. No. 869,459

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—76 **24 Claims**



1. An apparatus adapted for coupling to a multiple furnace installation which comprises a plurality of burners, a corresponding plurality of inlet air plenums and a vertically disposed exhaust stack, for recovering the heat energy in waste gases produced in said burner and escaping through said stack, and for delivering said recovered waste heat to inlet air flowing through each of said inlet air plenums, said apparatus comprising:

(a) a vertically disposed, self-supporting, frame structure;

(b) an exhaust gas duct for carrying exhaust gas therethrough, said exhaust gas duct being mounted to an upper portion of said frame structure and being mechanically coupled to and in communication with said stack;

(c) a first heat exchanger means having an inlet and an outlet for receiving and discharging a heat transfer fluid, said first exchanger means being disposed within said exhaust gas duct for absorbing heat from said exhaust gas flowing therethrough;

(d) a plurality of inlet air ducts, corresponding to said plurality of burners and inlet air plenums, for carrying inlet air therethrough, each of said inlet air ducts being mechanically coupled to and in communication with said corresponding inlet air plenum;

(e) a corresponding plurality of second heat exchanger means, each having an inlet and an outlet for receiving and discharging said heat transfer fluid, each of said second exchanger means being disposed within said corresponding inlet air duct for heating the inlet air passing therethrough, the inlet of each of said second heat exchanger means being in communication with the outlet of said first heat exchanger means, and the outlet of each of said second heat exchanger means in communication with the inlet of said first heat exchanger means through conduit means so as to define a flow circuit for said heat transfer fluid;

(f) a reservoir for maintaining a reserve of said heat transfer fluid, said reservoir being mounted on said frame structure and being in communication with said flow circuit; and

(g) pumping means for circulating said heat transfer fluid through said flow circuit, said pumping means being mounted on said frame structure and being in communication with said flow circuit,

whereby, said apparatus may be brought to the site of said furnace installation, disposed adjacent thereto and inter-coupled to said exhaust stack and to said plurality of inlet air plenums without placing a structural load on said furnace installation.

4,180,129

PLATE TYPE CONDENSER

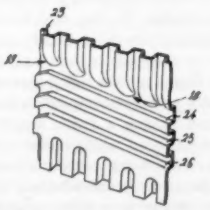
Hiroyuki Sumitomo, Takatsuki, Japan, assignor to Hisaka Works, Ltd., Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,497

Claims priority, application Japan, Sep. 8, 1976, 51-108215; Sep. 8, 1976, 51-108216; Oct. 21, 1976, 51-127027; Oct. 21, 1976, 51-127028

Int. Cl.[2] F28B *9/08*

U.S. Cl. 165—110 **4 Claims**



1. In a plate type condenser comprising a plurality of heat transmitting plates assembled face to face to form therebetween passages for steam and cooling liquid alternately, each of said plates having

a condensate collecting and discharging means consisting of inclined grooves and vertical grooves arranged for each given region in a heat transmitting surface on the steam passage side thereof, and

a plurality of longitudinal grooves extending between the the inclined grooves in the direction of the condensate stream and communicating at the lower end thereof with the inclined groove,

wherein the improvement which is characterized in that the longitudinal grooves are curved smoothly at their lower portions in the direction of the inclined groove.

4,180,130

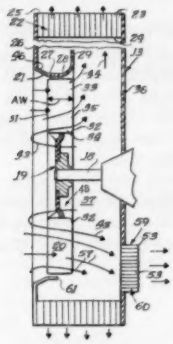
HEAT EXCHANGE APPARATUS INCLUDING A TOROIDAL-TYPE RADIATOR

Harold D. Beck, Downers Grove, and C. Paul Kolthoff, Jr., Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 728,657, Oct. 1, 1976, Pat. No. 4,136,735, which is a continuation-in-part of Ser. No. 543,713, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 472,257, May 22, 1974, abandoned. This application Oct. 23, 1978, Ser. No. 954,057

Int. Cl.[2] F28F 9/22

U.S. Cl. 165—124 26 Claims



1. A heat exchange apparatus comprising:

a heat exchanger means including a toroidal radiator structure, said toroidal radiator structure including a toroidal radiator core having a plurality of radially extending cooling air passageways formed therethrough, said toroidal radiator structure further including a first radially extending wall and a second radially extending wall axially spaced and substantially parallel with respect to said first wall, said first and second walls substantially defining the axial limits of said toroidal radiator core and an air-receiving plenum chamber disposed radially inwardly of said toroidal radiator core; a rotatable, axial flow fan having a plurality of circumferentially spaced, radially extending impeller blades; a generally annular fan shroud means supported within an opening formed through said first wall and encircling the fan, said fan shroud means including a generally cylindrical, axially extending throat section, an annular, generally radially xtending flat flange section, said flat flange section being spaced radially outwardly and axially in a direction downstream from said throat section and having a radial length substantially equal to the axial length of said cylindrical throat section, said fan shroud means being positioned with respect to said toroidal radiator structure whereby said flat flange section lies substantially in a plane spaced and parallel with respect to said first and second walls, and an annular intermediate section extending between and operatively interconnecting said throat section and said radial flat flange section, said throat section, intermediate section, and radial flat flange section being effective to produce a low pressure region between the air stream flowing over the surface thereof and said surface when the fan is in operation; and an auxiliary heat exchange means mounted on said toroidal radiator structure comprising, an auxiliary radiator structure including an auxiliary radiator core, said auxiliary radiator core having a plurality of cooling air passageways formed therethrough, said air passageways providing air communication between the exterior of said toroidal radiator structure and the interior of said plenum chamber.

4,180,131

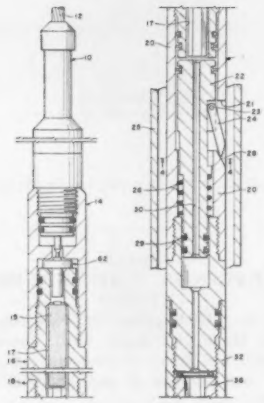
CHEMICAL CUTTING APPARATUS FOR USE IN WELLS

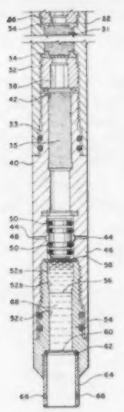
Edmond D. Chammas, Houston, Tex., assignor to Weatherford/DMC, Houston, Tex.

Continuation-in-part of Ser. No. 830,511, Sep. 6, 1977, Pat. No. 4,125,161. This application Oct. 20, 1978, Ser. No. 953,141

Int. Cl.[2] E21B 29/00

U.S. Cl. 166—55 18 Claims





1. Apparatus for cutting an object within an earth bore, comprising a generally elongate, cylindrical structure including a first section and a depending second section, said first section having in one or more subs,

(a) means for suspending the apparatus within the bore,

(b) firing means for producing ignition temperatures,

(c) means for generating gas by ignition from the firing means (b),

(d) anchor means for maintaining the apparatus substantially stationary in axial relation to the earth bore during the cutting operation,

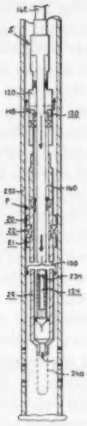
(e) chemical means releasably contained within the apparatus for incendiary cutting of the object within the earth bore upon release of said chemical means, and

(f) said second section including reactant and severing means for promoting reaction of and directing the chemical means toward the object to be cut within the earth bore, said reactant and severing means being integrally formed of a single sub member of a material that will not enter into the incendiary cutting reaction.

4,180,132
SERVICE SEAL UNIT FOR WELL PACKER

Carter R. Young, Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 29, 1978, Ser. No. 920,284
Int. Cl.[2] E21B *33/128, 33/129*
U.S. Cl. 166—120 6 Claims



1. A service seal unit for hydraulically setting a well packer in a well bore and directing fluid flow through said packer into said well bore comprising: a body mandrel provided with first and second separate longitudinal flow passages for fluid circulation through said seal unit to and from said well bore below said packer; valve means on said body mandrel for communicating one of said flow passages with said well bore around said unit above said packer; valve means on said body mandrel for communicating the other of said flow passages with ports in said packer leading to said well bore below said packer; hydraulic means comprising an annular cylinder and piston assembly on said body mandrel for operating a setting sleeve of said well packer; a setting sleeve releasably connected on said annular piston engageable wih said setting sleeve of said packer for setting said packer; latch means on said body mandrel including radially movable lugs for engaging said packer setting sleeve internally for restraining said setting sleeve against premature setting while said packer is manipulated to a desired location for setting in said well bore and releasable from said packer setting sleeve upon movement of said annular piston toward said packer setting sleeve; and coupling means on said body mandrel for releasably coupling said unit with the body mandrel of said packer while said hydraulic means operates said setting sleeve of said packer.

4,180,133
GUIDANCE SYSTEM FOR TOWED VEHICLES

Thomas J. Collogan, Greenfield, Wis.; David C. Boeding, Princeton; Michael P. Hermanson, Story City, both of Iowa, and Stanley P. Wellman, Bakersfield, Calif., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 12, 1978, Ser. No. 869,007
Int. Cl.[2] A01B *69/00*
U.S. Cl. 172—26 18 Claims

1. In combination, a towed farm implement having first and second opposite sides with a tool bar extending therebetween and a tongue structure extending forwardly from said tool bar, and

a guidance system for said implement comprising,

a compensating hitch means pivotally secured at its rearward end to the forward end of said tongue structure and adapted to be connected at its forward end to the lower links of a three-point hitch of a prime mover,

control means for selectively adjusting the position of said hitch means with respect to the lower links of a three-point hitch of a prime mover to which it is attached,

means for marking a furrow in the ground as said implement is towed, said marking means extending from said sides of said implement,

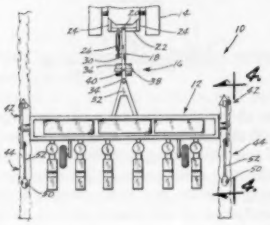
a follower extending from said implement to be operationally engaged by said furrow so that said implement is a predetermined distance from said furrow,

detecting means operatively connecting to said follower for electrically detecting the deviation of said implement from said predetermined distance from said furrow, and

an electronic circuit means electrically connecting said control means to said detecting means so that a predetermined deviation of said implement from said predetermined distance from said furrow activates said control means to adjust the position of said hitch means to align said implement at said predetermined distance from said furrow.

12. In combination with an implement having a tongue means rigidly connected thereto and extended forwardly therefrom, a compensating hitch means comprising,

an elongated swinging drawbar member having frontward and rearward ends and comprising a single rigid element extending from said frontward end to said rearward end,



said frontward end adapted for pivotal connection to a prime mover and said rearward end adapted for pivotal connection to said implement,

a hydraulic cylinder pivotally connected at one end to said drawbar member and adapted at the other end for pivotal connection to a prime mover, said drawbar member including hydraulic cylinder connecting means rigidly affixed to said rigid element, said one end of said hydraulic cylinder being directly connected to said connecting means such that the extension of the cylinder arm causes said drawbar to pivot in one transverse direction relative to said prime mover and the retraction of said arm causes said drawbar to pivot in the other transverse direction relative to said prime mover, and

means for controlling the extension and retraction of said cylinder arm,

said tongue means being directly pivotally connected to said rigid element at said rearward end of said elongated swinging drawbar member whereby said tongue means is transversely moved in unison with said rearward end of said elongated swinging drawbar member for direct corrective steering of said implement in response to pivotal movement of said drawbar member.

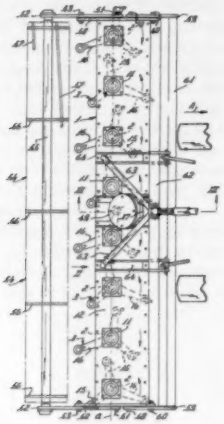
4,180,134
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Dec. 14, 1977, Ser. No. 860,281
Claims priority, application Netherlands, Dec. 20, 1976, 7614117
Int. Cl.[2] A01B *19/06*
U.S. Cl. 172—59 18 Claims

1. A soil cultivating implement comprising a frame and a plurality of soil cultivating members rotatably mounted in a transverse row on an elongated hollow portion of said frame,

said frame portion extending transverse to the direction of travel and said members being rotatable about corresponding upwardly extending axes, driving means connected to oscillate said members about their axes and said driving means including eccentric drive means interconnected to said members, said drive means being housed within said frame portion and an input connected to transmit power to said driving means, said driving means comprising at least two eccentric mechanisms



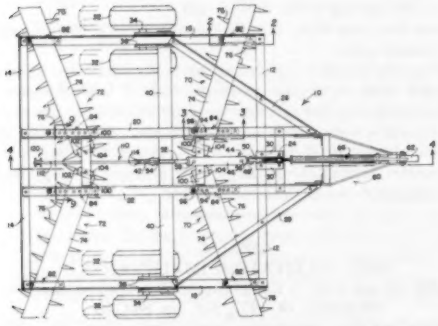
arranged one above the other on a common upwardly extending drive shaft that is located substantially centrally relative to said row of soil cultivating members when viewed from the rear, one eccentric mechanism being directly connected to a soil cultivating member and that member being adjacent one side of the midpoint of said frame portion, when viewed from the rear, said one mechanism also being directly connected to a further soil cultivating member that is second from the opposite side of said midpoint.

4,180,135

HYDRAULIC ANGLING MECHANISM FOR DISC HARROW GANGS

Eugen J. Birkenbach, Park Ridge, and Robert D. Woodworth, Clarendon Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jul. 7, 1975, Ser. No. 593,511
Int. Cl.[2] A01B *21/02*
U.S. Cl. 172—407 **10 Claims**



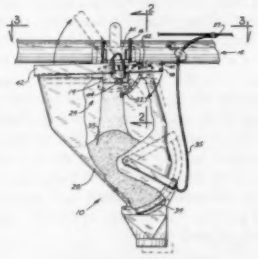
1. In a disc harrow of the type having a generally rectangular frame structure including a pair of spaced outside main longitudinal frame members and a pair of inside longitudinal intermediate frame members, pairs of front and rear disc gangs operatively associated with said frame structure on generally opposite sides of said intermediate frame members and having gang beams which are arranged in end-to-end relationship and carry disc blades designed for engagement with the ground, suspension means between said outside main longitudinal frame members and said gang beams providing a sliding pivot for the latter relative to the former, suspension means between said inside longitudinal intermediate frame member and said gang beams permitting sliding therebetween, a connector device extending between adjacent ends of the gang beams of each pair and adapted upon longitudinal shifting movement thereof to effect a change in ang. lar relationship of the associated pair of disc gangs, a transverse pivot shaft mounted on said frame structure, having trailing wheel axle arms and a crank arm extending radially therefrom, said axle arms, pivot shaft and crank arm establishing, in effect, a bell crank arrangement whereby forward and rearward swinging movement of the crank arm will effect lowering and raising of the frame structure to bring the disc blades into and out of engagement with the ground, and an hydraulic cylinder effective between the frame structure and crank arm to swing the latter in opposite directions, the improvement which comprises: a floating link pivoted at one end to said crank arm and projecting slidingly through one of said connector devices, and an abutment member adapted for selective positioning lengthwise on said floating link forwardly and rearwardly of said one connector device and engageable therewith for longitudinal shifting thereof upon actuation of said cylinder, and cooperating means on said link and abutment member whereby the latter may be releasably mounted on the former in selected positions of longitudinal adjustment.

4,180,136

WEIGHT ACTUATED FEED DROP APPARATUS

Robert D. Jones, Oskaloosa, Iowa, assignor to Intraco, Inc., Oskaloosa, Iowa

Filed Sep. 15, 1978, Ser. No. 942,675
Int. Cl.[2] G01G *13/02, 13/18;* A01K *1/10*
U.S. Cl. 177—68 **11 Claims**



1. A weight actuated dispensing mechanism comprising:
a bracket means adapted to be attached to a conveyor system and having an inlet opening therein for receiving materiel from the conveyor system and an outlet opening for allowing said material to exit said bracket means by gravity;
a valve means pivotally attached along an axis to said bracket means for movement between a first position wherein said valve means closes said outlet opening of said bracket means and a second position wherein said valve means allows said outlet opening to be open;
a container means disposed below said bracket means for receiving material exiting said outlet opening;
a projection means on said valve means for automatically increasing the closing force on said valve as it closes; and
flexible line means attached to said valve means and extending over said projection means and being further attached to said container means and comprising a means for holding said container under said outlet opening.

4,180,137
LIQUID-COOLED ENGINE ARRANGEMENT FOR A TWO-WHEELED VEHICLE

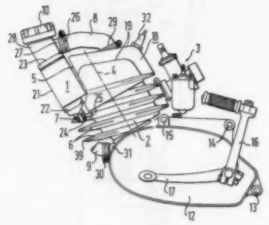
Gerolf Wagner, Schwebheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 3, 1978, Ser. No. 883,325

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 7707510[U]

Int. Cl.[2] B60K *11/04*

U.S. Cl. 180—229 **12 Claims**



1. A liquid-cooled engine arrangement for a two-wheeled vehicle and the like including a frame, the arrangement comprising:

(a) a motor unit including a cylinder having an axis, a cylinder head fixedly fastened to one axially terminal portion of said cylinder and a crankcase fixedly fastened to the other axially terminal portion of said cylinder, said unit being formed with a recess therein;

(b) fastening means for fastening said motor unit to said frame;

(c) a radiator fixedly fastened to said unit in said recess and exposed to the ambient atmosphere during movement of said vehicle; and

(d) conduit means connecting said radiator to said cylinder for circulating a cooling liquid between said cylinder and said radiator.

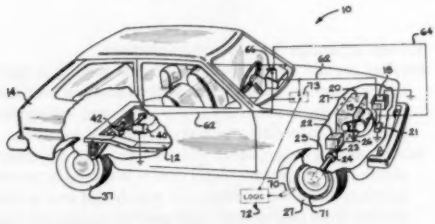
4,180,138
VEHICLE HAVING AUXILIARY DRIVE MECHANISM

Dennis W. Shea, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 30, 1977, Ser. No. 838,283

Int. Cl.[2] B60L *11/14, 11/12*

U.S. Cl. 180—65 A **8 Claims**



1. A vehicle comprising:

a first wheel and a first axle adapted for operative driving engagement with said first wheel;

an internal combustion engine adapted for operative driving engagement with said first axle;

generating means driven by said internal combustion engine;

a battery adapted to be charged by said generating means;

a second wheel, a second axle said second wheel being selectively rotatable relative to said second axle and means for selectively drivingly engaging said second axle with said second wheel;

an electric motor drivingly engaged with said second axle and selectively drivingly engageable with said second wheel through said second axle upon actuation of said electric motor, said electric motor drivingly connected to said battery; and

means for selectively actuating and deactuating said electric motor.

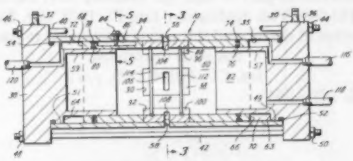
4,180,139
FLUID OPERATED SEISMIC GENERATOR

Garland H. Walker, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 804,116, Jun. 6, 1977, abandoned. This application May 12, 1978, Ser. No. 905,491

Int. Cl.[2] G01V *1/38*

U.S. Cl. 181—120 **15 Claims**



1. A seismic sound source for releasing gas under pressure into a body of water, comprising:

a chamber for containing the gas including an exhaust port through which the gas may be released;

a valve member mounted for motion within the chamber and positionable against the exhaust port in a plurality of sealing positions to block release of the gas from the chamber, the valve member including an orifice therethrough; and

an actuator for rapidly moving the valve member to and fro in a continuous linear motion from a first sealing position to a second different sealing position through an open position in which the orifice is aligned with the exhaust port to release some of the gas.

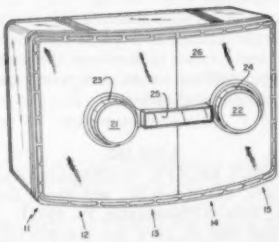
4,180,140
LOUDSPEAKER PORTING

Neal H. Marshall, Bolton, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Aug. 31, 1978, Ser. No. 938,404

Int. Cl.[2] H05K *5/00;* **A47B** *81/06*

U.S. Cl. 181—156 **3 Claims**



1. In a ported loudspeaker system having a cabinet with a baffle plate supporting a plurality of high compliance loudspeaker drivers thereon with port tube means mounted in openings therein and having a port tube mass for resonating with the cabinet compliance and damping means in said port tube means for reducing the Q of the resonant system comprising the cabinet compliance and the port tube mass, the improvement comprising,

means for detachably securing said damping means to said port tube means including snap cap means detachably

securing said damping means over an end of said port tube means normally inside said cabinet,

grill means adjacent said baffle plate for covering said loudspeaker drivers and formed with open area accommodating said port tube means,

grill retaining means engaging said grill means to urge the latter towards said loudspeaker drivers covered thereby and formed with an open area for accommodating said port tube means,

and fastening means engaging the end of said port tube means outside said cabinet and for urging said grill retaining means toward said grill means.

4,180,141

DISTRIBUTOR FOR GAS TURBINE SILENCERS

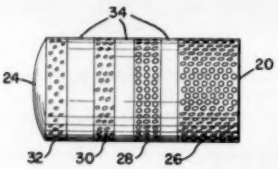
Frederick V. H. Judd, 1465 Strong Ave., Copiagne, N.Y. 11726

Continuation-in-part of Ser. No. 634,848, Nov. 24, 1975, Pat. No. 4,105,089. This application Jan. 27, 1978, Ser. No. 872,746

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] **F01N** *1/08, 1/10*

U.S. Cl. 181—264 **3 Claims**



1. The combination of a gas flow distributor and a sound silencer for muffling the vibrations and sounds of a noisy turbulent exhaust gas stream emitted from a combustion gas turbine, said flow distributor comprising an elongated chamber, closed by cylindrical walls on all sides and a wall at one end, having an open inlet for connecting to a gas turbine exhaust, said chamber being sized to accommodate a turbulently noisy flowing stream of combustion gas exhausted from said turbine, means for solidly coupling the open end of said flow distributor chamber to the exhaust emitted from said turbine, perforations passing through and disposed about the walls of said flow distributor in number, size and spacing graduated from lower to greater gas flow restriction from said open end inlet to the lateral perforation outlets to emit the gas stream passing through said flow distributor in substantially even radial nonturbulent flow therefrom, shielding means deflecting the exhaust gas stream emitted by said flow distributor in flow radially therefrom through a splitter type noisy sound muffling means mounted to receive and split said radial exhaust gas flow into smaller parallel streams and muffle the noisy sound emitted by each of said streams in flow over the surfaces thereof, said splitter type muffling means comprising spaced parallel porous sound absorbing elements.

4,180,142

EMERGENCY ESCAPE OPENABLE SKYLIGHT

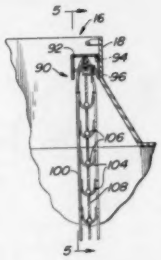
Richard Sevillano, 611 Reach St., and Rocco Bruno, Jr, 847 Foulkrod St., both of Philadelphia, Pa. 19111

Filed May 25, 1978, Ser. No. 909,733

Int. Cl.[2] **E04F** *11/04;* **E06B** *5/00*

U.S. Cl. 182—77 **1 Claim**

1. A skylight usable as an emergency escape route, comprising: a housing having sidewalls; a cover, a substantial area of said cover being constructed of a transparent material; a hinge attaching the cover to one of the sidewalls of said housing; means for resiliently biasing said cover to the open position; latch means for maintaining said cover in a normally closed position against the force of said resilient biasing means; shock absorber means mounted between said cover and said housing for dampening the motion of said cover; and retractable ladder means mounted at least partially to said housing, said retractable ladder means including a plurality of rigid ladder rungs supported in the extended position by a flexible ladder rung support means having ladder rung supports at predetermined ladder rung positions, said flexible ladder rung support means being comprised of a pair of flexible ladder rails, each ladder rail being comprised of a pair of parallel flexible straps, said rung supports being comprised of flexible straps interconnecting said parallel flexible straps, a pully arrangement in said retractable ladder means including ropes passing over the pulley arrangement for raising and lowering said flexible ladder rung support means, said retractable ladder means being maintained by ladder latching means in a normally retracted position and being openable to an extended position for emergency exit through the skylight when said cover is in the open position.



4,180,143

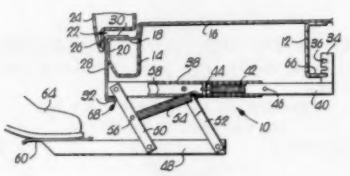
STEP FOR VEHICLES

George D. Clugston, R.R. #3, Box 203, Pittsburg, Kans. 66762

Filed Jul. 21, 1978, Ser. No. 926,864

Int. Cl.[2] **B60R** *3/02*

U.S. Cl. 182—91 **5 Claims**



1. Step apparatus for vehicles, including:

parallel motion type mounting means having a normally upper member, means adapted for fastening said member to a vehicle, a normally lower arm, and swingable link means for suspending said arm from said member,

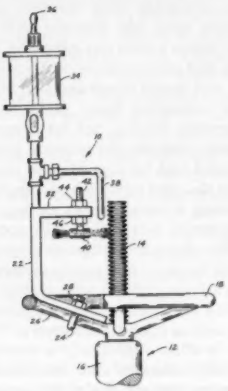
said mounting means being shiftable between a storage condition thereof in which said arm is disposed adjacent said member and a use condition in which said arm is disposed further from said member and said link means are disposed in a position inclined generally downwardly and away from vertical toward one extremity of said arm;

a step carried by said arm adjacent the other extremity thereof; and

means mounted on said upper member for blocking said link means against further swinging movement toward vertical when said mounting means is shifted from said storage condition thereof into said use condition thereof, whereby said link means are maintained by gravity in said inclined position thereof when said mounting means is in said use condition thereof and the weight of a user is applied atop said step, thereby automatically stabilizing and preventing

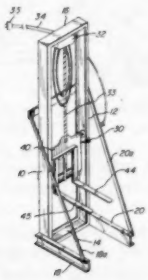
shifting of said step when the latter is mounted by a user, without the need for a locking device.

4,180,144
VALVE STEM CLEANER AND LUBRICATOR
Harold R. Adams, St. Francisville, Ill. 62460
Filed Mar. 2, 1978, Ser. No. 882,557
Int. Cl.[2] F16N *11/00*
U.S. Cl. 184—1 R **11 Claims**



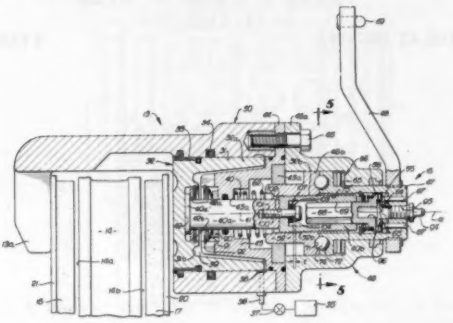
1. A device for cleaning threaded valve stems on valves having a valve housing comprising a brush, means for mounting said brush on the valve housing, said brush having bristle elements adapted to contact the threads in said valve stem, the brush being comprised of a ring-like brush holder, said holder being comprised of semi-circular members having first end portions pivotable together in order that the holder can be opened and fitted around the valve stem and means for connecting a second end of said members together in closed position.

4,180,145
STATIONARY FORKLIFT AND METHOD OF USE
Vidal D. Capps, 1601 S. Ivanhoe, Denver, Colo. 80224
Filed Jul. 17, 1978, Ser. No. 924,945
Int. Cl.[2] B66B *11/04*
U.S. Cl. 187—17 **6 Claims**



1. A stationary forklift device comprising:
(a) frame means including a pair of inwardly facing upright channels for supporting the running gear of a carriage, and lateral brace means mounted on the bottom of said channels against a load carried by a carriage;
(b) a carriage mounted in said inwardly facing channels, having extending lift fork tines over said brace means;
(c) running gear for said carriage including upper rollers secured to an upper portion of said carriage at about 45° directed into the forward corners of said upright channels and lower rollers secured to a lower portion of said carriage at about 45° directed into the rear corners of said upright channels, said rollers combining to counteract against movement of said carriage under a load on said lift forks and torque of a laterally uneven load; and,
(d) means for raising and lowering said carriage.

4,180,146
BRAKE ASSEMBLY WITH DUAL COMPENSATION ADJUSTMENT
Franklin B. Airheart, Northridge, Calif., assignor to Hurst Performance, Inc., Warminster, Pa.
Filed Mar. 13, 1978, Ser. No. 885,510
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—71.8 **15 Claims**



1. In a brake assembly, the combination comprising
(a) a carrier having a bore, and a piston slidable axially in the bore to transmit force of fluid pressure acting on the piston to a brake pad,
(b) shaft structure defining an axis and extending axially to transmit auxiliary thrust to the piston, said structure including first and second shaft sections having a first lost motion interconnection,
(c) a rotary actuator member rotatable about said axis,
(d) coupling means responsive to rotation of said member in one direction to effect axial advancement of the shaft structure toward the piston and responsive to rotation of said member in the opposite direction to allow axial retraction of the shaft structure,
(e) first wear compensation mechanism subject to adjustment to axially shift the shaft structure in response to fluid pressure produced axial displacement of the piston beyond a predetermined amount, and
(f) second wear compensation mechanism subject to rotary adjustment to axially shift the shaft structure in response to rotation of said member beyond a predetermined amount,
(g) said first and second compensation mechanisms being operatively interconnected via the shaft sections whereby shifting of the shaft structure by one of said compensation mechanisms serves to effect a corresponding compensating adjustment of the other of said wear compensating mechanisms,
(h) the first shaft section being coupled to the first compensating mechanism, and the second shaft section coupled to the second compensating mechanism, the second compensating mechanism including interengageable elements respectively associated with the second shaft section and said rotary actuator member to provide unidirectional rotary coupling which is releasable in response to rotation of said member in said opposite direction, there being a

second lost motion connection between the rotary actuator and one of said elements, and

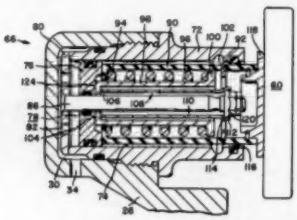
(i) said coupling means including a sleeve having threaded engagement with the shaft second section, whereby the sleeve may be displaced axially with the shaft structure to axially advance the shaft structure endwise toward the piston, the shaft second section also being rotatable relative to the sleeve in response to said rotary adjustment of the second wear compensation mechanism, thereby to axially advance the shaft second section relative to said sleeve, to compensate for brake wear.

4,180,147

INTEGRAL PISTON AND ADJUSTER FOR A BRAKE

Richard A. Tjarksen; Robert J. Keresztes, and Eugene E. Harnish, all of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 3, 1978, Ser. No. 892,448
Int. Cl.[2] F16D *65/54*
U.S. Cl. 188—71.8 **4 Claims**



1. In a brake having a plurality of friction disc located between a pressure plate and a backing plate, an actuator mechanism for moving the pressure plate toward the backing plate in response to an operational brake signal, said actuator mechanism comprising:

a housing having a bore therein;

piston means located in said bore for establishing a chamber therein, said chamber being connected to a source of fluid;

a stem fixed to said housing and extending through said piston means into said bore, said stem providing a guide to maintain said piston means in axial alignment in said bore on movement of the piston means;

a first tube member having a first cylindrical body with a radially inwardly projecting lip extending from a first end for engaging said piston means and a second end, said first cylindrical body being located in said bore by a first bearing surface and constructed of an insulator material to reduce the transfer of thermal energy from said seond end to both the piston means and housing;

a spring concentrically positioned on the interior of said first tube member having a first end engaging said inwardly projecting lip of said first cylindrical body and a second end;

a second tube member having a second cylindrical body concentric to said first cylindrical body and having a radially inwardly projecting flange on a first end and a radially outwardly projecting flange on a second end, said outwardly projecting flange engaging said second end of said spring;

keeper means attached to said first cylindrical body for engaging said radially outwardly projecting flange to hold said spring in a caged position between said inwardly projecting lip on the first cylindrical body and said outwardly projecting flange on the second cylindrical body;

a third tube member having a third cylindrical body concentric to said second cylindrical body, said third cylindrical body having a first diameter section connected to a second diameter section by an annular ramp section, said first diameter section engaging said inwardly projecting flange on said second cylindrical body; and

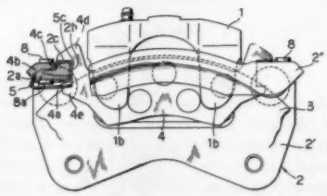
button means secured to said stem and engaging said second diameter and tapered sections of said third cylindrical tube to position said piston means in said bore to establish the size of said chamber and to establish an air gap between the second end of the first cylindrical member and the pressure plate, said piston means responding to a pressure of the fluid in said chamber corresponding to the operational brake signal by overcoming said spring and moving said first cylindrical body through said air gap and into engagement with said pressure plate while at the same time said piston means engaging said inwardly projecting flange on said second cylindrical body to form a solid link between said piston means and said button means through said third cylindrical body, said piston means thereafter simultaneously moving said first, second and third cylindrical bodies toward said pressure plate and said pressure plate toward said backing plate to compress the plurality of friction disc and effect a brake application, said friction disc creating thermal energy during said brake application, said button means elastically and plastically expanding said first diameter section upon movement of said third cylindrical body by said piston means to lock said button means in a fixed position with respect to said third cylindrical body and hold said third cylindrical body in a stationary position upon termination of fluid pressure in said chamber to allow said spring to return said piston means toward said chamber and reestablish substantially the same dimensional air gap after every brake application, said air gap forming a barrier to reduce the transfer of thermal energy between the pressure plate and said first cylindrical body, said insulator material of said first cylindrical body further reducing the transfer of thermal energy from said second end toward said first end to prevent said thermal energy from affecting the movement of said piston means in the bore and said third cylindrical body with respect to the button means.

4,180,148

ANTI-RATTLE SPRING MEMBER FOR A DISC BRAKE PAD

Teruo Souma, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 15, 1978, Ser. No. 933,747
Claims priority, application Japan, Aug. 24, 1977, 52-101332
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.5 **6 Claims**



1. A disc brake having a disc axis, the brake comprising:

(a) a disc rotor rotatable about said disc axis;

(b) a stationary supporting member having a pair of circumferentially spaced torque receiving arms extending substantially parallel to said disc axis, said arms being provided with a pair of substantially radially extending pad-insert-slots formed on mutually confronting portions thereof;

(c) a pad assembly having, on each lateral end, a respective engaging-slot for slidably engaging with respective ones of said torque receiving arms, a respective ledge on the nearer side of each said engaging-slot to said disc axis, and a respective lip, protruding laterally beyond each said

ledge, formed on the remoter sides of said engaging slots from said disc axis;

(d) an actuator for urging said pad assembly onto said disc rotor; and

(e) a pair of anti-rattle springs made of stainless steel material, each of said anti-rattle springs being an integrally formed element with (1) an anti-rattling spring portion disposed between said pad assembly and respective ones of said torque receiving arms for biasing said pad assembly in a direction normal to said disc axis to prevent rattling of said pad assembly when the brake is in vibration, (2) an anti-friction-increasing shim portion extending from said anti-rattling spring portion to cover a contacting surface of the corresponding said torque receiving arm upon which said pad assembly engaging-slot is engageable, to prevent friction from increasing due to rust between said pad assembly and the corresponding said torque receiving arm, and (3) a covering portion extending from said anti-friction-increasing shim portion for covering an inner portion of the corresponding said pad-insert-slot so as to restrict the size of opening of the same such that the corresponding said ledge is allowed to pass through and the corresponding said lip is not allowed to pass thereby facilitating radial positioning of said pad assembly to said torque receiving arms.

4,180,149

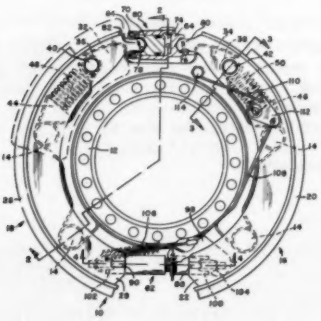
DRUM BRAKE AND MOUNTING MEANS THEREFOR

Donald D. Johannesen, and Orla L. Holcomb, Jr., both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 784,010, Apr. 4, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 925,912

Int. Cl.[2] F16D *51/14*

U.S. Cl. 188—340 **5 Claims**



1. A drum brake for a vehicle comprising:

a backing plate secured to a non-rotatable portion of the vehicle, said backing plate including a plurality of radially circumferentially spaced, extending lugs and a pair of radially extending flanges having recesses thereon;

at least a pair of brake shoes each having axial inner and outer webs engageable with said lugs to retain said brake shoes substantially axially fixed relative to said backing plate while allowing radial movement of said brake shoes during a braking application, said pair of brake shoes including portions between said webs extending into said recesses on said backing plate; and

resilient means biasing the portions of said pair of brake shoes into engagement with said backing plate recesses whereby said pair of brake shoes are movable radially during a braking application to move the portions out of engagement with the recesses in opposition to said resilient means;

said axial inner and outer webs having an outer radial dimension and an inner radial dimension to define a radial width therebetween, said lugs and said flanges extending into the radial width between said webs and said resilient means being circumferentially disposed within the radial width between the axial inner and outer webs, said resilient means remaining entirely within said radial width between the axial inner and outer webs when said brake shoe portions are extended into said recesses on said backing plate.

4,180,150

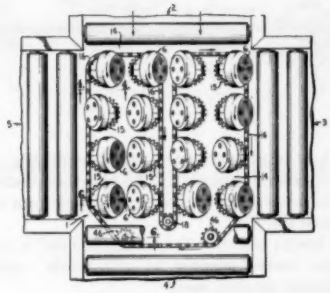
MULTI-DIRECTIONAL TRANSFER DEVICE

Archie S. Moore, 3925 NE. 54th St., Kansas City, Mo. 64119

Filed Oct. 27, 1977, Ser. No. 845,876

Int. Cl.[2] B65G *47/00*

U.S. Cl. 198—366 **5 Claims**



2. A transfer station for transferring articles from a conveyor, said transfer station comprising a field of single wheels that support said articles during the transfer thereof, each of said wheels being tilted at a non-vertical fixed angle from a horizontal plane and drivable, and steerable in a horizontal plane about an upwardly projecting axis, said field of single tilted wheels being positioned in a plurality of rows with individual wheels in a single row being tilted in opposite directions but driven for article movement in the same direction.

4,180,151

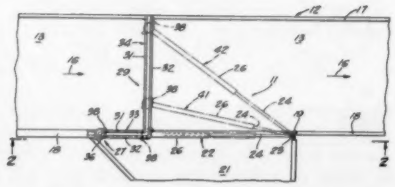
FLOW DIVERTING GATE FOR CONVEYORS

LeRoy E. Goertz, Upland, Calif., assignor to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Jul. 24, 1978, Ser. No. 927,582

Int. Cl.[2] B65G *47/76*

U.S. Cl. 198—367 **8 Claims**



1. A flow control assembly in combination with a longitudinal conveyor including longitudinal conveyor means and a sidewall disposed along one side thereof, the sidewall forming an opening along its length, the flow control assembly comprising an extendable and retractable gate having one end pivotably mounted adjacent one end of the opening in the sidewall and a guide unit operatively coupled with an unpivoted end of said gate, said guide unit including first guide means for extending said gate to a position to close the sidewall opening and for retracting said gate to form an opening therein, said guide unit including a second guide portion for

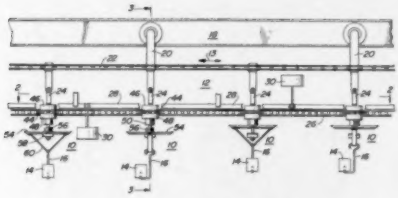
moving the unpivoted end of said gate across the conveyor means in order to selectively reduce the effective flow capacity of the conveyor.

4,180,152

LOAD BEARING PENDANT SYSTEM

Robert Sefcik, 3 Briar La., Cherry Hill, N.J. 08002

Filed Feb. 22, 1978, Ser. No. 880,200
Int. Cl.[2] B65G *17/32, 37/00*
U.S. Cl. 198—377 **10 Claims**



1. A load bearing pendant system comprising:

(a) means for displacing said load bearing pendant system in a linear direction substantially normal to a vertically directed axis line;

(b) a hanger assembly threadedly coupled to said displacement means adapted to releaseably capture objects mounted thereon; and,

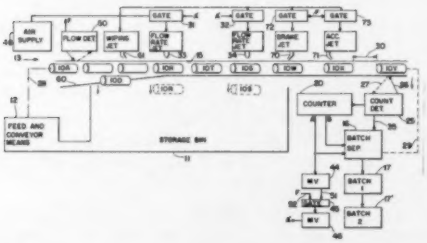
(c) hanger drive means rotatively coupled to said displacement means and threadedly engageable with said hanger assembly for (1) rotatively displacing said hanger assembly about said vertically directed axis line when said hanger drive means is threadedly engaged to said hanger assembly, and (2) permitting said hanger assembly independent rotational displacement with respect to said hanger drive means when said hanger drive means is threadedly disengaged from said hanger assembly.

4,180,153

HIGH SPEED BATCH COUNTING APPARATUS

Ravi C. Krishnan, Bethesda, and Charles M. Blackburn, District Heights, both of Md., assignors to Sigma Systems, Inc., Capitol Heights, Md.

Filed Apr. 27, 1978, Ser. No. 900,729
Int. Cl.[2] B65G *47/28*
U.S. Cl. 198—425 **17 Claims**



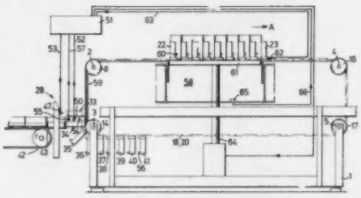
17. Batching apparatus for counting out batches of pieces flowing along a stream of continuously moving pieces including batch separating means receiving a counted number of pieces from said stream, means producing a greater gap separation between pieces of two successive batches in said stream at a position before the stream enters said batch separating means and means operable during said gap actuating said batch separating means.

4,180,154

DUAL INSIDE/OUTSIDE CONVEYORS WITH SEPARATE DRIVES

Claes-Göran Andersson, Göthenborg, Sweden, assignor to Wikings Mekaniska Verkstad AB, Göthenborg, Sweden

Filed Apr. 4, 1978, Ser. No. 893,380
Claims priority, application Sweden, May 17, 1977, 7705833
Int. Cl.[2] B65G *43/08*
U.S. Cl. 198—466 **4 Claims**



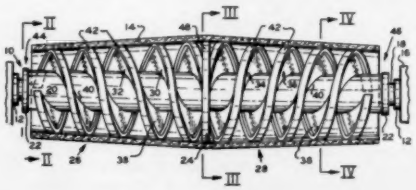
1. A conveying device for conveying groups of objects (**29–32**) from an infeed station (**28**) to an outfeed station (**58**) by means of two endless conveyors (**18, 19; 20, 21**), each of which carries at least one array of pick-up devices (**33–41**), characterized by: separate drive means (**6, 7**) arranged a) to individually move the two conveyors independently of one another in a direction from the infeed station to the outfeed station, b) to drive the respective conveyors stepwise to index the pick-up devices carried thereon through the infeed station for picking up at least one object during the dwell period between each movement step; and (c) to drive the respective conveyors in a continuous movement between the infeed station and the outfeed station, both of the conveyors traversing the same path during their respective moments.

4,180,155

MULTIPLE PITCH SELF-CLEANING BELT PULLEY

Ronald A. Stevick, Cement City, Mich., assignor to Industrial Service & Manufacturing Co., Clark Lake, Mich.

Continuation-in-part of Ser. No. 746,304, Dec. 1, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,862
Int. Cl.[2] B65G *45/00*
U.S. Cl. 198—498 **5 Claims**



1. A pulley for a belt conveyor or the like adapted to primarily rotate in a given direction about a longitudinal axis and characterized by its self-cleaning and belt supporting ability comprising, in combination, a shaft defining an axis of rotation, said shaft including first and second ends and a central region intermediate said ends, a plurality of radially disposed webs formed of plate material helically circumscribing said shaft, said webs each including an inner edge disposed adjacent said shaft and an outer edge radially spaced from said shaft, at least two webs extending from said central region to said first end constituting a first web set and at least two webs extending from said central region to said second end constituting a second web set, the webs of a set being helically disposed about said shaft in a common direction and each web having an inner end located at said central region and an outer end located adjacent a common shaft end, said webs of a set being interspaced between each other defining a multiple helix wherein a

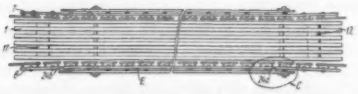
plane at right angles to said shaft axis intersecting a web set intersects at least two web outer edges, the webs of said first set being helically disposed about said shaft in a direction opposite to that of the webs of said second set and in such a direction relative to said given direction of pulley rotation that foreign matter within a web set is axially translated in a direction from said shaft central region toward a shaft end for discharge from the web at a shaft end, a circular disc affixed to said shaft central region lying in a plane substantially perpendicular to said shaft axis, said disc having an outer edge defining a diameter substantially equal to the diameter of said webs' inner ends constituting a belt supporting periphery and said webs' inner ends terminating at said disc, said webs' and disc's outer edges constituting a belt supporting periphery and being of an axial dimension greater than the thickness of the plate material forming said webs and disc.

4,180,156

DEVICE FOR HANDLING FLASKLESS MOULDS

Alexei I. Popov, ulitsa Geroev Truda, 29, kv. 267; Vladimir D. Pepenko, pereulok Maryanenko, 1, kv. 9; Jury G. Vinjukov, ulitsa Mayakovskogo, 11, kv. 15; Leonid I. Matjurin-Veretennikov, ulitsa Timurovtsev, 17, kv. 19; Vladimir M. Stepanov, Pavlovo-pole, 5 mikroraion, 75, kv. 14, and Viktor G. Grubman, ulitsa Dzerzhinskogo, 65, kv. 24, all of Kharkov, U.S.S.R.

Filed Jun. 20, 1977, Ser. No. 808,651
Int. Cl.[2] B65G *15/20*
U.S. Cl. 198—726 **6 Claims**



1. A device for handling flaskless moulds, comprising: a stationary bed adapted for arranging flaskless moulds assembled into a horizontal stack; and a means for moving a stack of flaskless moulds along said stationary bed comprising: two sprocket endless chains having upper and lower horizontal runs running along both sides of said stationary bed; grips mounted on each of said endless chains for retaining a stack of flaskless moulds during travel along said stationary bed, the grips on one chain always facing the grips on the other chain; guides associated with the upper horizontal runs for top horizontal portions of said endless chains, said guides being positioned so as to provide the drawing together of the top horizontal portions of said endless chains above said stationary bed so that the grips are brought smoothly to and from the stack of the flaskless moulds.

4,180,157

APPARATUS FOR HANDLING MANURE

Georges H. Bessette, 185, 15e Ave., Iberville, Québec, Canada

Filed Mar. 30, 1978, Ser. No. 891,841
Claims priority, application Canada, Feb. 22, 1978, 297538
Int. Cl.[2] B65G *25/04*; F04B *21/04*
U.S. Cl. 198—747 **8 Claims**

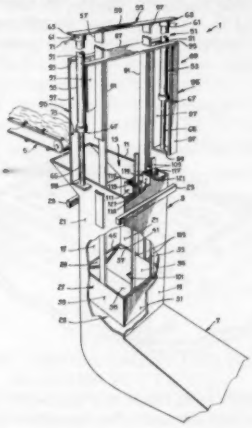
1. Apparatus for handling manure, comprising:

a passageway for receiving the manure through on inlet end;

plunger means slidable in the passageway for pushing manure through the passageway in a direction from the one inlet end toward the other end, said plunger means comprising a pair of swinging doors movable between a first position were they close the passageway and a second position where they open the passageway;

first moving means connected to the plunger means for moving the same in the passageway toward and away from the one inlet end; and

second moving means connected to the pair of swinging doors of the plunger means for moving the door to the first closed position when the plunger means moves away from the one inlet end, and for moving the doors to the



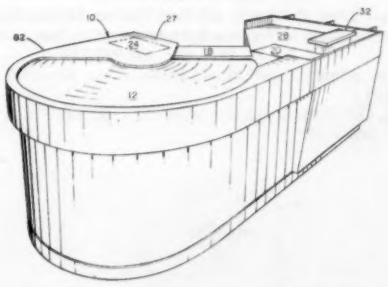
second position when the plunger moves toward the one inlet end.

4,180,158

CONVEYOR ASSEMBLY FOR USE IN CHECK OUT STANDS

Roderick J. Frederick, 1205 6th Ave. South, Seattle, Wash. 98134

Filed Apr. 28, 1978, Ser. No. 901,150
Int. Cl.[2] B65G *15/02*; A47F *9/02*
U.S. Cl. 198—831 **14 Claims**

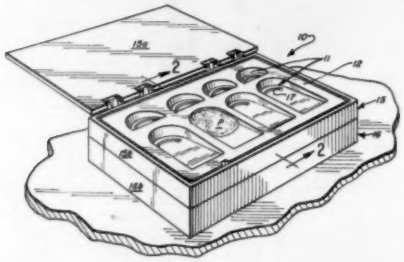


1. A conveyor assembly comprising a flexible disc shaped circular belt folded over under itself to form an upper product carrying run and a lower run, said upper run being substantially larger than said lower run and including the center of said circular belt, means confining said belt for rotation about a fixed vertical axis extending through said center, a stationary support underlying a substantial portion of said upper run, means drivingly engageable with said belt for imparting rotation to said belt about said axis, and guide means engageable along the folded portion of said belt connecting said upper and lower runs to maintain said belt in predetermined folded configuration during rotation thereof, said means confining said belt for rotation about said axis comprising a part secured to the upper run of the belt at the central region of said belt extending about said center.

4,180,159
MIXING TRAY ASSEMBLY

Asami Tanaka, 4840 Foster St., Skokie, Ill. 60077

Filed Apr. 13, 1978, Ser. No. 895,940
Int. Cl.[2] B65D *81/22*; B67D *3/00*; B44D *7/00*
U.S. Cl. 206—63.5 7 Claims

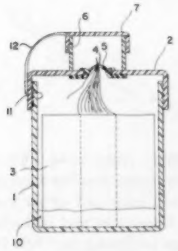


1. A tray assembly for use in mixing at least one ingredient with a liquid to form a product having a predetermined moisture content and maintaining the moisture content thereof while the product is disposed within the tray assembly; said tray assembly comprising a receptacle having a surface for mixing and supporting thereon the product and an elongated trough in said surface for delivering the liquid to a substantial part of the supported product, a reservoir for the liquid mounted in spaced subtending relation with respect to said receptacle, and an elongated wick having one end thereof disposed within said reservoir and adapted to be immersed within the liquid accommodated therein and a second end thereof disposed within said receptacle and communicating with said trough and the portion of said surface adjacent thereto whereby the moisture content of the product is replenished by capillary action of the liquid from the reservoir through the wick to the trough and product.

4,180,160
WET TISSUE CONTAINER

Kiyohisa Ogawa, Funabashi, and Seiji Eshima, Mitaka, both of Japan, assignors to Wakodo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1978, Ser. No. 929,720
Claims priority, application Japan, Aug. 10, 1977, 52-107297[U]
Int. Cl.[2] B65D *81/22*, *83/00*; B65H *1/00*; B65F *3/00*
U.S. Cl. 206—210 5 Claims

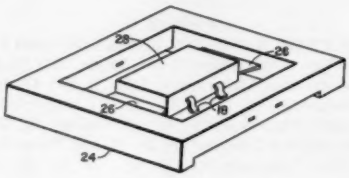


1. A wet tissue container comprising a receptacle for storing and dispensing a length of tissue strip having spaced perforation lines, a liquid in said receptacle, a cap removably connected to receptacle and provided with a wet tissue drawing member therein, said drawing member being dome-shaped and constituted of a material of high elasticity, and a tissue drawing hole in the apex of said drawing member having a fine diameter whereby when said wet tissue is drawn through said drawing hole excessive moistening liquid in said tissue is squeezed therefrom and returned to said receptacle.

4,180,161
CARRIER STRUCTURE INTEGRAL WITH AN ELECTRONIC PACKAGE AND METHOD OF CONSTRUCTION

David L. Henrickson, Phoenix; John J. Kaiser, Scottsdale, both of Ariz.; William C. Koehn, Pollockshields, Scotland, and David P. Raven, North Wales, Pa., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 768,298, Feb. 14, 1977, Pat. No. 4,102,039.
This application May 4, 1978, Ser. No. 902,628
Int. Cl.[2] B65D *81/06*, *85/30*, *75/22*
U.S. Cl. 206—328 4 Claims

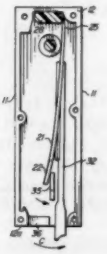


1. A carrier structure integral with an electronic component for protecting the electronic component comprising:
(a) a plastic encapsulated device;
(b) a plastic disposable packaging means disposed around said device; and
(c) frangible plastic tab means connected between said device and said package means for supporting said device in a fixed relationship to said disposable packaging means, and a pair of interfaces between said tab means and said device and said tab means and said packaging means being constituted by a continuous integral bond.

4,180,162
COMBINATION DISPENSER-DISPOSAL CARTRIDGE FOR A SURGICAL BLADE

Herbert C. Magney, 433 W. Linda La., Chandler, Ariz. 85224

Filed Dec. 4, 1978, Ser. No. 966,134
Int. Cl.[2] B65D *83/10*
U.S. Cl. 206—363 1 Claim



1. A combination dispenser-disposal cartridge for a surgical blade, specially adapted for machine-loading of said blade therein, comprising:
(a) means defining an elongate open-topped box portion including floor, side walls and end walls and having an aperture in one end wall thereof;
(b) blade-positioning means formed integrally with said box portion, including
(i) means defining a slot extending upwardly from the floor of said box along a side of said aperture, said slot

being dimensioned to receive the shank end of a surgical blade, and

(ii) blade tip holding means comprising at least two members extending upwardly from the floor of said box and spaced apart to receive and frictionally engage the tip and at least a portion of the cutting edge of said blade therebetween,

said slot and blade tip holder cooperating to position said blade such that the shank portion thereof curvingly extends from the tip rearwardly to the shank portion thereof;

(c) a cover member for the open top of said box portion having downwardly projecting positioning studs which cooperate with mating recesses in the side walls of said box member to position said cover on the open top of said box member;

(d) blade stripping means for separating a used surgical blade from a scalpel handle, including

(i) a finger member extending upwardly from the floor of said box portion intermediate the side walls thereof for urging the shank end of said blade away from said scalpel handle and for stripping said blade from the boss thereof as said scalpel handle is withdrawn from said aperture, and

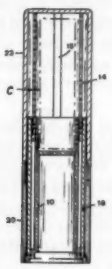
(ii) an abutment shoulder formed in the lower edge of said aperture for contacting the lower rear edge of said blade as it is stripped from said scalpel handle boss and for retaining said blade within said box portion when said scalpel handle is withdrawn therefrom.

4,180,163

CYLINDRICAL CONTAINER

Libero Grioni, Via San Francesco d'Assisi, 9, Trezzano Sul Naviglio (Milan), Italy

Filed Nov. 13, 1978, Ser. No. 959,615
Claims priority, application Italy, Nov. 18, 1977, 22769/77[U]
Int. Cl.[2] A45D *40/00*
U.S. Cl. 206—385 **5 Claims**



1. A cylindrical container particularly suitable for containing lip-sticks, cocoa-butter, shaving-soap or sticks and the like cosmetical products, characterized in that it consists of four coaxial hollow cylindrical members, inserted into one another and effective to mutually slide, in which:

the first cylindrical member, the innermost one, is provided, at the upper portion thereof, with a small cup for containing the lower portion of the product to be housed and, laterally, axially and all along the length thereof, with a projecting nose;

the second cylindrical member has an inner diameter greater than the outer diameter of the first cylindrical member thereby keying thereonto, and it is provided, on the inner surface thereof, axially and all along the length thereof, with a slot thereinto inserts and therethrough slides the projecting nose of the first cylindrical member and, on the outer surface thereof, diametrically and at the lower end thereof, with two projecting and slanted nose members;

the third cylindrical member has an inner diameter greater than the outer diameter of the second cylindrical member, thereby keying onto this latter, behind provided, on the inner surface thereof, which two helical slots crossing one another, in each slot inserting one of the two projecting nose members of said second cylindrical member, and

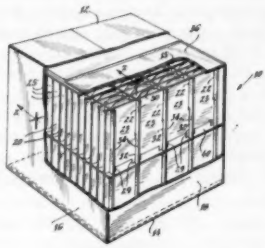
the fourth cylindrical member, acting as the handle of the container, having an inner diameter greater than the outer diameter of the third cylindrical member, and having a height lower than that of said cylindrical members and being fixed to the lower portion of the first cylindrical member.

4,180,164

PACKAGING ARRANGEMENT FOR U-SHAPED FLUORESCENT LAMPS

Andrew Durden, Trumbull, and Malcolm E. Sorrell, Norwalk, both of Conn., assignors to Voltarc Tubes, Inc., Fairfield, Conn.

Filed Oct. 25, 1978, Ser. No. 954,329
Int. Cl.[2] B65D *85/42, 85/62, 81/02*
U.S. Cl. 206—419 **8 Claims**



1. A packaging arrangement for housing a plurality of U-shaped fluorescent lamps having an outer corrugated container comprising in combination,

(a) a plurality of first corrugated inserts extending across a first dimension of said container having a plurality of aligned, spaced slots extending inward a predetermined distance from a first edge thereof and forming tongues therebetween,

(b) a plurality of tabs having inwardly extending opposed concave sides shaped to receive the legs of U-shaped fluorescent lamps spaced between said slots of said first insert and extending from the second edge thereof opposite said first edge, said tabs having score lines along a lower extremity thereof above said opposed concave sides adapted when bent along said score lines to extend between and receive in the opposed concave sides thereof the legs of a U-shaped fluorescent lamp,

(c) a plurality of second corrugated inserts extending across a second dimension of said container having a plurality of aligned, spaced slots which are complementary to the aligned, spaced slots of said first insert, and

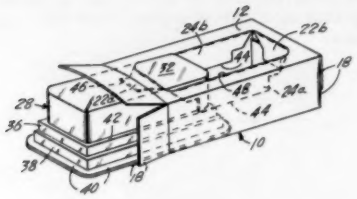
(d) said first and second inserts being mounted on each other in said container with said slots being in alignment and said inserts between positioned orthogonally with respect to each other forming a plurality of rectangular compartments therein adapted to house U-shaped fluorescent bulbs therein which are received in each compartment by bending said shaped tabs of said first insert along said score lines which captivates the legs of the U-shaped lamp in the compartments and thereby limits movement therein.

4,180,165

BLISTER PACKAGE

Morris W. Kuchenbecker, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 20, 1978, Ser. No. 898,453
Int. Cl.[2] B65D *25/54*
U.S. Cl. 206—461 **2 Claims**



1. A package comprising a carton and an insert receivable within said carton, said insert including a blister element open at the bottom thereof and forming a cavity for receiving the packaged product, said blister element including a portion thereof extending outwardly and laterally from said cavity and forming a bearing surface; said carton comprising a multiplicity of interconnected panels including a first panel adapted to support said insert and a second panel adapted to overlie said insert, said second panel having an opening therewithin formed by one or more portions of said second panel being turned inwardly to form respective locking tabs depending generally downwardly from said second panel for bearing against said bearing surface thereby to hold said insert in place against said first panel, said portion of said blister element extending outwardly and laterally from said cavity includes a step portion extending peripherally around said cavity, and wherein said insert further includes a platform member received within said step portion.

4,180,166

PATCHING KIT WITH AGGREGATE AND TWO-PART EPOXY BINDER SYSTEM

Vernon H. Batdorf, Minneapolis, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Nov. 13, 1978, Ser. No. 959,510
Int. Cl.[2] B65D *81/32*
U.S. Cl. 206—568 **13 Claims**

1. A method for coating a surface with an epoxide mortar comprising the steps of:

(a) blending together the following substantially compatible components to form a curable epoxide binder material:

1. a substantially water insoluble curable vicinal epoxide composition including a polyglycidyl ether of a polyhydric phenol, said polyglycidyl ether having an epoxide functionality greater than 1 but less than about 3,
2. a substantially water insoluble polynuclear cycloaliphatic polyamine having a primary amine functionality greater than 1 but less than 4,
3. a hydrophobic agent, which agent includes a higher aliphatic group and a polar group;

(b) adding at least 200 parts by weight of aggregate and a lubricating amount of water to each 100 parts by weight of said curable epoxide binder material, thereby forming a curable epoxide mortar containing a substantially incompatible water phase generally uniformly distributed through said epoxide mortar;

(c) spreading a layer of said epoxide mortar onto a surface and permitting at least a portion of said substantially incompatible water phase to form a film of water on the top of said layer; and

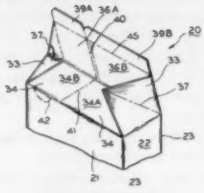
(d) curing said curable epoxide binder material in said layer to a thermoset solid.

4,180,167

CARTON HAVING RECLOSABLE SPOUT

David R. Leavitt, Kirkland, and Gerald R. Pfieffer, Seattle, both of Wash., assignors to Container Corporation of America, Chicago, Ill.

Filed May 30, 1978, Ser. No. 910,490
Int. Cl.[2] B69D *5/74*
U.S. Cl. 206—622 **3 Claims**



1. In a carton formed from a cut and scored blank of paperboard or the like:

(a) major and minor pairs of sidewalls foldably interconnected to define a tube of rectangular cross-section with first and second end closure structures;

(b) each of said closure structures comprising:

(i) first and second minor closure flaps foldably connected to respective minor sidewalls, each of said first and second minor closure flaps including a pair of gusset elements foldably joined to each other;

(ii) a first major closure flap extending from one of said major sidewalls and foldable to a position underlying certain of said minor closure flaps when the latter are folded to closed position with respect to their related minor sidewalls;

(iii) a second major closure flap extending from the other of said major sidewalls and being connected along side edges thereof to said first and second minor closure flaps and being foldable to closed position overlying said minor closure flaps and said first major closure flap;

(iv) a glue flap extending from an edge of said second major closure flap and being foldable to closed position overlying and secured to a marginal area of said first ma[illegible]idewall;

(c) said first end closure structure having a portion of said second major closure flap and a portion of said adjacent glue flap detachably connected along a line of weakness from the remaining portions of the second major closure flap and glue flap, respectively, so as to provide a dispensing opening in said closure structure whereby said portions and said first minor closure flap are erectable to form a dispensing opening.

4,180,168

TWO-WAY ENVELOPE

Walter L. Hiersteiner, Shawnee Mission, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.

Filed Jul. 13, 1978, Ser. No. 924,350
Int. Cl.[2] B65D *27/34, 27/06*
U.S. Cl. 206—626 **7 Claims**

1. A two-way envelope comprising:

(a) a body panel having an inner and an outer surface, upper and lower edges and side edges,

(b) a pair of opposed side flaps having outer edges and being integrally connected to said body panel and demarcated from said body panel side edges, said side flaps having an inner and an outer surface,

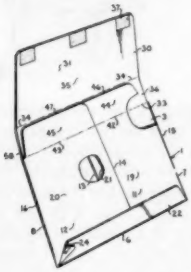
(c) a bottom flap integrally connected to said body panel and demarcated therefrom by a fold line along said body panel lower edge,

(d) a seal flap having an inner surface and an outer surface, said seal flap being integrally connected to said body panel and demarcated therefrom by a tear line along said body

panel upper edge, a fold line extending along said seal flap which is spaced upwardly from said body panel upper edge, said seal flap extending upwardly beyond said seal flap fold line forming an upper portion thereabove, seal adhesive on said seal flap inner surface upper portion,

(e) a fold line extending along said respective side flaps and approximately colinear with said body panel upper edge, said side flaps each having an upper portion extending upwardly beyond said side flap fold lines and terminating in an upper edge below said seal flap fold line,

(f) said side flap upper portions having an inner side edge and seal adhesive on said side flap inner surfaces,



(g) said side flaps being folded along said body panel side edges over said body panel inner surface, said side flaps partially overlapping each other and being adhesively joined, said bottom flap being folded along said body panel lower edge and joined to at least one of said side flaps, said side flaps and bottom flap and body panel forming a pocket open between said seal flap and said side flap upper portions,

(h) said seal flap being folded along said seal flap fold line over said side flap upper portions to seal said pocket for a first trip, said seal flap being disconnected from said body panel along said seal flap tear line and said side flap upper portions being folded along said side flap fold lines to seal said pocket for a second trip.

4,180,169

WINDOW DISPLAY SUPPORT FOR FINGER RINGS

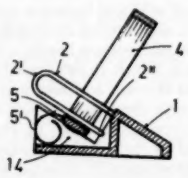
Fausto Michels, Pregassona, Switzerland, assignor to Laniere S.A., Crissier, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,509

Claims priority, application Switzerland, Dec. 1, 1976, 15170/76

Int. Cl.[2] A47F *7/02*

U.S. Cl. 211—13 **2 Claims**



1. A window display support for finger rings including a base with a step and a riser on its upper surface and a flexible tongue secured to the upper portion of the riser and extending in its undeformed condition upwardly rearwardly from said riser a substantial distance from said step, said tongue being capable of being deformed into a U shape to form an elastic clip to hold the ring to be displayed on said step of the base.

4,180,170

ROTARY TOWER CRANE FOR CONSTRUCTION PURPOSES WITH A DISTRIBUTOR DEVICE FOR CONCRETE

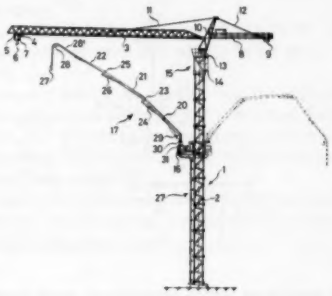
Bernhard Meinken, Haltern, Fed. Rep. of Germany, assignor to Freiedrich Wilhem, Schwing GmbH, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,388

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710366

Int. Cl.[2] B66C *23/00;* **F16L** *3/16*

U.S. Cl. 212—1 **6 Claims**



1. A rotary tower crane for construction purposes, comprising a non-rotating mast, a boom mounted at the head of the mast by a rotary connection so as to be swingable about the mast axis, a lifting device on the boom consisting of a hoisting rope which can be raised and lowered, and a distributor device for supplying and distributing concrete in the working area of the crane, which distributor device comprises a platform mounted on the mast below said rotary connection, and a distribution arm, serving as a carrier structure for a concrete conveyor pipe, formed in a plurality of sections connected together by power actuated connections and having a rotating mechanism located on the platform, the platform being mounted by a power actuated rotational coupling for swinging movement about an axis parallel to the axis of the crane mast, so as to provide an operational field for the platform which is limited by the extent of swing of the platform on both sides of the crane mast.

4,180,171

CRANES

Sinclair U. Cunningham; Donald Firth, and Douglas Jackson, all of East Kilbride, Scotland, assignors to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 29, 1977, Ser. No. 828,595

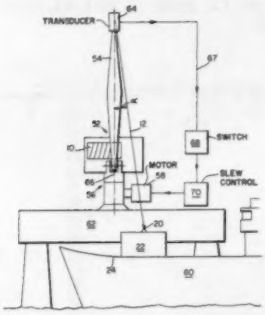
Claims priority, application United Kingdom, Sep. 1, 1976, 36244/76

Int. Cl.[2] B66D *1/50*

U.S. Cl. 212—61 **5 Claims**

1. A crane having a crane rope; means for attaching a load to said crane rope; a crane winch having a drum on which said crane rope can be wound; a crane motor which can drive said crane winch for hauling in or letting out said crane rope; a measuring winch having a drum with a measuring line windable thereon of length sufficient to reach at least as far as the crane rope can reach; a measuring winch motor which can turn the measuring winch drum to wind in or out said measuring line; means for attaching the outer extremity of the measuring line, away from the drum, to one of a load to be lifted by said crane and a deck supporting said load; first transducer means operated by the measuring winch to provide a displacement signal proportional to any change, in relation to a predetermined value, and having regard to sign, of the length of mea-

suring line extending from the measuring winch drum to the said load; crane motor control means operable by said displacement signal to control the crane motor to haul in or let out the crane rope substantially in synchronism and to the same extent with any motion of the outer extremity of the measuring line; slewing means, to slew the crane about a vertical axis, including a slewing motor and slewing motor control means; and a



second transducer which produces an angle signal related in magnitude and sign to angular displacement of the crane rope, from a given angle, including zero, from the vertical, normal to its radial distance from the said vertical axis; and arranged so that any said angle signal is fed to said slewing motor control means to actuate the slewing motor and slew the crane so that any said angular displacement will be substantially counteracted.

4,180,172

LOAD CARRYING VEHICLE TRAILER

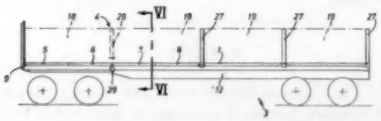
Axel G. Torneback, Box 12046, S-580 12 Linkoping, Sweden

Filed Feb. 15, 1977, Ser. No. 768,714

Claims priority, application Sweden, Feb. 18, 1976, 7601824; Apr. 5, 1976, 7600396

Int. Cl.[2] B60P *1/64*

U.S. Cl. 414—522 **14 Claims**



1. An assembly for a long load carrying vehicle, said assembly comprising:

(a) a loading surface means having a front part and a rear part and being disposed on a chassis,

(b) said loading surface means including first and second portions,

(c) said first portion being located in said rear part and slidably disposed to move in the direction of the longitudinal axis of the vehicle,

(d) said second portion being located in said front part and hingedly connected on one outer edge to said first portion and on the other outer edge to said chassis,

(e) said second portion having at least one pair of hinged sections effective to fold transversely to said longitudinal axis,

(f) said second portion being effective to fold outwardly from said loading surface means when said first portion moves in a direction toward said second portion and to subsequently straighten out when said first portion moves in a direction away from said second portion.

4,180,173

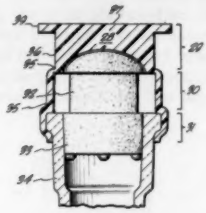
TAMPER-PROOF CLOSURE SYSTEM

Stephen H. Diaz, Los Altos Hills, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 13, 1977, Ser. No. 860,196

Int. Cl.[2] B65D *1/04*

U.S. Cl. 215—6 **5 Claims**



1. In combination, a two-compartment mixing vial having a constriction between the two compartments, a removable plug disposed within the constriction to provide a liquid-tight barrier between the two compartments, the vial being closed at one end and having a neck at the other end thereof for defining an opening communicating with one of said compartments, said neck defining an annular rim adjacent the free end thereof in surrounding relationship to said opening, a primary closure attached to said vial for closing the opening in said neck, said primary closure including a resilient stopper having a nonprotuberant portion snugly and slidably disposed within the neck for closing said opening, said stopper also having a protuberant portion which is fixedly attached to said nonprotuberant portion and projects outwardly beyond the free end of said neck, said protuberant portion having a transverse dimension which is smaller than the transverse dimension of said opening, comprising the improvement wherein a hollow frangible secondary closure is disposed about the protuberant portion of the stopper and is fixedly connected to the neck of said vial, said secondary closure including:

(1) a plunger having a top wall and upstanding sidewalls, which are displaced outwardly from said protuberant portion, said sidewalls having at least the lower edges thereof spaced upwardly from but substantially longitudinally aligned with the free end of said annular rim, whereby imposition of a longitudinally directed pushing force on said plunger causes it to axially slide toward said neck with the slidable displacement of said plunger being limited by engagement of the lower edges of said sidewalls with the free end of said annular rim;

(2) a lower collar in encircling engagement with the annular rim formed on the neck so as to fixedly connect said secondary closure to said vial while resisting non-destructive disengagement therebetween;

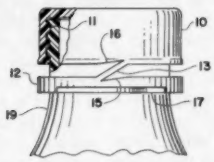
(3) a mid-portion integrally joining the lower edge of said plunger to said lower collar, said mid-portion extending longitudinally of said vial between said lower collar and said sidewalls in surrounding relationship to said protuberant portion, said mid-portion having a length in said longitudinal direction which is substantially greater than the radial thickness thereof, and said mid-portion having an interior transverse dimension which is greater than the exterior transverse dimension of that portion of the plunger defined by the sidewalls thereof so that said sidewalls can be telescopically received within said mid-portion as the plunger is slidably moved toward said annular rim; and

(4) an attenuated fracture zone about the lowermost periphery of the plunger sidewalls at the location where said sidewalls are joined to said mid-portion, whereby imposition of a pushing force on the plunger causes fracture along said zone so that the plunger telescopes into the mid-portion as the plunger is slidably urged toward the vial, the latter movement causing the plunger to engage and drive the stopper toward the closed end of the vial.

4,180,174
CHILD-RESISTANT CLOSURE

David R. Quinn, Pembroke Pines, Fla., assignor to The AFA Corporation, Miami Lakes, Fla.

Filed Nov. 16, 1978, Ser. No. 961,356
Int. Cl.[2] B65D *55/02, 85/56;* H61H *1/00*
U.S. Cl. 215—221 11 Claims

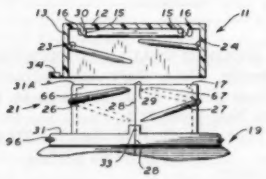


1. A child-resistant closure for closing a necked container with a screw thread formed on the neck, said closure including a top and a sidewall with the sidewall having an internal screw thread adapted to engage the screw thread of the container neck, said internal screw thread cut off at the lower edge of said sidewall in a plane perpendicular to the longitudinal central axis of the closure and a screw thread segment adapted to match said cut off thread and to move selectively from a matched first position to a second position away from but in parallel relationship to the cut off thread.

4,180,175
BLOW MOLDED PLASTIC BOTTLE AND ANTITAMPER CAP

John J. Virog, Jr., Massapequa Park, and Leo Von Hagel, North Massapequa, both of N.Y., assignors to Maxcap, Inc., New York, N.Y.

Continuation of Ser. No. 770,025, Feb. 18, 1977, Pat. No. 4,098,419. This application Jun. 30, 1978, Ser. No. 921,043
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.[2] B65D *55/02*
U.S. Cl. 215—252 11 Claims



1. A combination of a blow molded plastic milk bottle and a plastic cap, comprising

(a) a neck at the mouth of said bottle, said neck having an external screw thread and an upper inwardly directed circumferential lip,

(b) said plastic cap adapted to be screwed onto said neck to cover said mouth and having an upper wall, a cylindrical side wall with an internal thread corresponding to said external thread, and a downwardly directed circular plug for engaging said lip when said cap is screwed onto said neck and to form an anti-leak seal by pressing against said lip,

(c) cooperating antitamper means on said cap and bottle and including a permanently deformable element, said antitamper means permitting said cap to be rotated in one direction to screw said cap onto said neck to bring said plug into sealing relation to said lip and then preventing rotation in an unscrewing direction unless said element is visibly deformed,

said threads being double-start threads comprising

a pair of external threads of identical pitch having effective portions substantially symmetrically disposed around the periphery of said neck and

a pair of internal threads of identical pitch having effective portions substantially symmetrically disposed around the internal periphery of said cap and each extending circumferentially for more than 150°,

said external threads being bends in the wall of said neck and said neck thus having corresponding internal grooves,

said effective portions of the two threads being at about 180° to each other,

the diameter of said neck being about 1 to 2 inches, the wall thicknesses of said neck and said lip being about 0.02 to 0.03 inch,

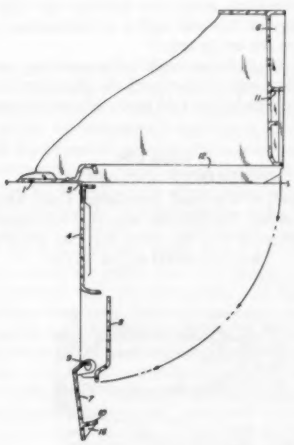
said plug having a circular outer surface for engaging said lip, said outer surface being tapered to increase in diameter upwardly and to exert an outward force on said lip and a corresponding inward force on said surface when said cap is screwed onto said neck,

said neck having a cylindrical portion having an axial height less than 0.8 inch and having a screw thread occupying an axial height less than 0.4 inch.

4,180,176
GRAVITY DUMP SHIPPING CRATE FOR POULTRY

Herbert W. Galer, Newnan, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 9, 1978, Ser. No. 959,280
Int. Cl.[2] B65D *43/16*
U.S. Cl. 217—57 4 Claims

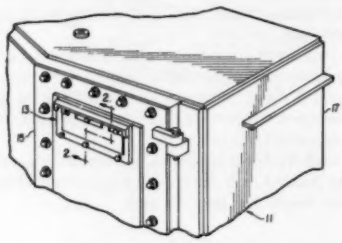


1. A readily dumped shipping crate comprising a container, a hinged cover therefor, and a latching panel on said hinged cover, said latching panel being pivotally mounted on the edge of the cover opposite the hinges thereof so that, in the open position it lies on said cover at least partially under a restraining means, and in the latched position it is suspended from its pivot in a position perpendicular to said cover.

4,180,177
PRESSURE VENT FOR EXPLOSION-PROOF ELECTRICAL ENCLOSURES

Robert J. Gunderman, Columbus; Keith Alcock, Upper Arlington; Charles S. Skinner, Northfield, and Michael W. Riley, Strongsville, all of Ohio, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 4, 1979, Ser. No. 27,133
Int. Cl.[2] F16K *17/12;* **B65D** *25/00*
U.S. Cl. 220—88 A **7 Claims**

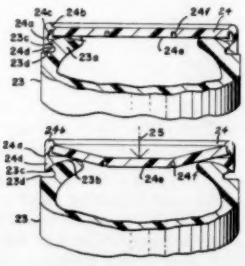


1. A pressure vent device, comprising:
(a) an enclosure for electrical apparatus,
(b) a vent opening extending from the interior to the exterior of the enclosure,
(c) flame arrestor means affixed in the opening for preventing flames from propagating through the opening in the event of an explosion of gases in the enclosure while permitting gas to vent through the opening at a predetermined pressure and a flow rate sufficient to preclude a pressure build-up,
(d) the enclosure including a seat surrounding the opening on the exterior side of the flame arrestor means,
(e) a cover sized and shaped to close the opening and fit against the seat for protecting the flame arrestor means,
(f) hinge means for connecting one edge portion of the cover to the enclosure while permitting an opposite edge portion to swing away from the seat,
(g) releasable latch means for holding said opposite edge portion against the seat until a predetermined pressure is reached in the enclosure,
(h) closing means for automatically returning said opposite edge portion into contact with the seat after the enclosure pressure drops below said predetermined pressure.

4,180,178
CONTAINER AND CLOSURE

Lloyd S. Turner, 50 Chestnut, Los Gatos, Calif. 95030

Continuation of Ser. No. 860,505, Sep. 24, 1969, abandoned. This application Dec. 26, 1974, Ser. No. 536,392
Int. Cl.[2] B65D *41/18, 41/10*
U.S. Cl. 220—281 **5 Claims**

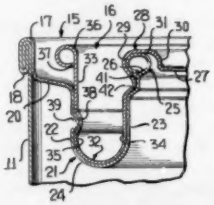


1. A container and a closure member therefor, said container comprising a mouth opening having a circumferential upper surface providing a fulcrum bearing and an outward projection extending circumferentially around the mouth opening, said closure member being formed of a pliable plastic material having a single normal configuration and comprising a cover panel having a flat top surface near the center thereof and having a circumferential skirt depending from the periphery thereof, said skirt of the closure member having an inward flange adapted to be pressed over the outward projection about the mouth of the container for securing the closure member upon said container, said cover panel of the closure member being formed with a hinge line encircling the flat surface in the center and disposed inside of the container mouth opening, said skirt of the closure member being normally operable to hold the inward flange in a secured position below the outward projection around the mouth opening of the container and being further operable axially to release the inward flange from the secured position when the flat central surface of the panel is depressed by external force to pivot the peripheral part of the cover panel about the hinge line and the fulcrum bearing of the upper surface of the container, said container having a planar surface extending outwardly below the skirt to prevent access to the bottom of the skirt whereby the closure member cannot be pried up from the container, an enlargement in the container spaced below the outward projection to form an annular groove therebetween, said inward flange of the skirt of the closure member normally extending into the annular groove in the secured position, the circumferential upper surface of the mouth opening of the container being positioned to abut against and provide a fulcrum bearing for the closure member, said fulcrum bearing being disposed circumferentially outside of the hinge, said closure member being operable to be deformed from the single normal configuration in response to the external force and pivot as a lever about said fulcrum bearing when the center is depressed to move the inward flange upwardly from the secured position in the annular groove and thereafter returns to the single normal configuration with the release of said force on the center, said hinge line being formed by a discontinuity in the thickness of the material forming the cover panel of the closure member, said flat central panel being formed of a thickness which is substantially less than the thickness of the peripheral parts of the cover panel, the parts being joined to form the hinge line with an abrupt change in material thickness.

4,180,179
BEADED SNAPLOCK CLOSURE

James R. Hoenig, Tinley Park, and Salvador C. Mallorca, Downers Grove, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,620
Int. Cl.[2] B65D *39/00*
U.S. Cl. 220—307 **10 Claims**



1. An end unit for a container comprising a ring and a detachable separately formed cover; said ring having a radially outer peripheral portion for forming a seam with a container body, a ring portion disposed radially inwardly of said outer peripheral portion, and a radially inner peripheral portion defining in cross section an axially outwardly opening U-shaped channel, said ring having an innermost free edge portion in the form of an annular hollow bead extending axially

outwardly of said U-shaped channel, said U-shaped channel in cross section having generally parallel sides; said cover having a recessed central portion defined by an intermediate axially inwardly opening annular channel receiving said ring hollow bead and being seated thereon, said cover having a radially outer peripheral portion defining in cross section an axially outwardly opening U-shaped channel received in said ring U-shaped channel, said cover U-shaped channel and said intermediate channel each having a wall forming a continuation of one another, said cover having a radially outermost free edge portion in the form of an annular hollow bead overlying said ring; said end unit being characterized by the radially outermost one of said ring U-shaped channel walls having an intermediate annular radially inwardly projecting bead, and the radially outermost one of said cover U-shaped channel walls having a complementary intermediate annular radially inwardly projecting bead receiving said ring radially inwardly projecting bead in releasable interlocking relation.

4,180,180

APPARATUS AND METHOD FOR AUTOMATICALLY DISPENSING FLEXIBLE CONTAINERS

Carl Fries, Jr., Philadelphia, Pa., assignor to International Paper Company, New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,505
Int. Cl.[2] B65G *59/10*
U.S. Cl. 221—1 **28 Claims**

1. Apparatus for the dispensing of flexible, elastic flanged containers having non-vertical sides from the bottom of a nested stack of said containers, comprising:

(a) a base;

(b) first means on the base for supporting said nested stack of containers;

(c) compressive means on the base for creating a gap between the flanges of the bottommost and penultimate container by applying opposing compressive forces to the sidewalls of said bottommost container to cause the containers nested in the bottommost container to rise vertically;

(d) separating means on the base, said separating means being arranged and constructed for insertion into said gap created by said compressive means, said separating means also being arranged and constructed so that it may support the penultimate container and the remainder of the stack nested in the penultimate container; and

(e) means for releasing the bottommost container from said base and from the remainder of the containers in said nested stack.

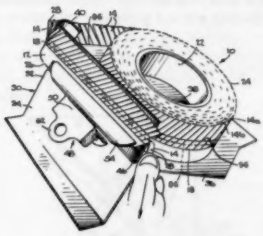
4,180,181

TAPE SPLICING DEVICE AND DISPENSER THEREFOR

Arthur Brandwein, 147-37 77 Ave., Flushing, N.Y. 11367

Filed Aug. 11, 1978, Ser. No. 932,862
Int. Cl.[2] B65H *5/28*
U.S. Cl. 221—70 **4 Claims**

1. A dispenser for a tape splicing device comprised of a marginal portion, a plurality of individual tab members extending away from said marginal portion, said tab members being disposed side by side with respect to each other, a strip of adhesive tape adjoining one end of each said tab member and said marginal portion, each said tab member having an opposite free end remote from said marginal portion, said marginal portion and said tab members being wound around a core and having a release coating to permit detachment of said adhesive tape strips from said marginal portion when the free end of each said tab member is pulled away from said marginal portion so as to peel said strips from said marginal portion, said dispenser comprising a frame, means on said frame for permitting unwinding of said marginal portion and said tab members from said core, guide means on said frame for establishing a



predetermined path of movement for said marginal portion and said tab members during said unwinding, said guide means including a bearing surface on said frame over which said marginal portion is passed when it is unwound, and resilient clamping means for holding the marginal portion against said bearing surface to facilitate the pulling of said tab members and said adhesive strips from said marginal portion.

4,180,182

DISPENSING MAGAZINE

Leonard A. Fish, Chicago, and Duane M. Mills, Western Springs, both of Ill., assignors to Bank Computer Network Corporation, Schiller Park, Ill.

Filed Nov. 23, 1976, Ser. No. 744,381
Int. Cl.[2] G07F *11/36*
U.S. Cl. 221—75 **12 Claims**

1. In a magazine assembly for a dispensng machine, the combination comprising a screw having a helical thread, a plurality of separate articles hung by hangers from said screw, supporting means for supporting said screw at one end for rotation, with the opposite end of said screw located above an article receiving area, said thread having a first portion with a continuous thread in which adjacent convolutions of said thread are spaced apart by a first distance, and a second portion, coaxial said first portion and interposed between said first portion and said opposite end, said second portion having a thread which meets smoothly with the thread of said first portion and in which adjacent convolutions of the thread are spaced apart by a distance greater than said first distance, said thread having the same handedness in both said first and second portions, some of the convolutions of said second portion being flattened on one side to enable a separation of said hangers so that a maximum of one hanger resides between adjacent convolutions of said opposite end.

4,180,183

TRAP DOOR FOR VENDING MACHINE

Alois Muller, 138 Elvaston Dr., Toronto, Canada

Filed Apr. 10, 1978, Ser. No. 894,740
Int. Cl.[2] B65H *3/30;* E06B *7/00*
U.S. Cl. 221—194 **5 Claims**

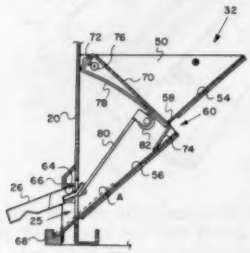
1. A self-closing chute for use in an article vending machine of the type having article storage and dispensing means, and

mechanism whereby an article may be dispensed and dropped downwardly under the influence of gravity, and comprising;

an article delivery chute located and arranged to catch a said article;

article opening means at the lower end of the chute, through which a said article may be retrieved;

moveable door means normally at least partially closing said article opening, and swingable relative thereto between an upwardly and outwardly open position, and a downwardly swung closed position;



chute closure means located inwardly with respect to said moveable means and swingably mounted, for movement between an inactive open position, and a rearwardly swung chute closing position, and,

operating means connecting between said door means and said closure means whereby when said door means is swung forwardly, said chute closure means is swung rearwardly.

4,180,184

FERTILIZER SPREADER

Richard H. Florer; Thomas E. Via, and James M. Weaver, all of Greenville, Ohio, assignors to Lambert Corporation, Dayton, Ohio

Filed Mar. 29, 1978, Ser. No. 891,064
Int. Cl.[2] A01C *15/06*
U.S. Cl. 222—41 **4 Claims**

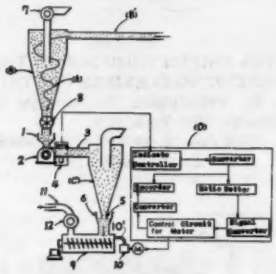
2. In a hand operated push-type fertilizer spreader which includes a wheeled hopper adapted to contain a quantity of fertilizer or the like for movement across the ground by means of a rearwardly extending handle, in which the rate of flow from the hopper is controlled by a shut-off and metering gate which is mounted at the bottom of the hopper and movable between a closed position and selected opened positions, and in which said handle terminates in a pair of outwardly extending hand grips, the improvement in control lever and flow indicating means comprising an operator lever pivoted on said handle and extending transversely to a position in normally forwardly inclined relation to one of said hand grips so that said one grip and lever may be grasped in common and squeezed together in abutment with each other, and metering means connecting said lever to operate said gate including a pull wire having one end connected in operative relation to said gate, an indicator dial pivoted on said lever, means connecting said pull wire to said dial, and adjustable coupling means connecting said dial to said lever whereby movement of said lever into abutment with said one grip causes a selective opening movement of said gate by said pull wire.

4,180,185

WEIGHT MEASURING METHOD OF POWDER IN AN AIR FLOW PROCESS AND APPARATUS THEREFOR

Teruo Yamamoto, Toyonaka; Fumikatsu Ishii, Takaishi, and Miyoji Fujiki, Kishiwada, all of Japan, assignors to Hokushin Gohan Kabushiki Kaisha, Motomachi, Japan

Filed Apr. 20, 1977, Ser. No. 789,840
Claims priority, application Japan, Dec. 13, 1976, 51-149571
Int. Cl.[2] B05B *17/00*
U.S. Cl. 222—57 **4 Claims**



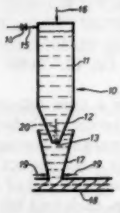
1. A method of measuring the weight of powder as the powder flows in air along a flow path, said method comprising providing a flow duct for said powder utilizing a constant speed, high pressure fan in communication with said flow duct to provide a continuous, uniform flow of the powder in said duct; utilizing a cyclone separator located at the output end of said duct to separate the powder; providing an opening to the ambient at both input and output ends of the flow path; defining a measuring region in the flow path within said flow duct; using a single radioactive beam transmitter and a single radioactive beam detector disposed on opposite sides of the wall of said duct to measure the density of the powder flow through said measuring region; utilizing the measurement produced by said radioactive beam transmitter and radioactive beam detector to determine the weight of the powder; and controlling the operation of a process in which said flow of powder is utilized, in accordance with the weight of the powder so determined.

4,180,186

HOPPER

Maurice Alphandary, Oxford, England, assignor to The United States of America as represented by the Administrator of the U.S. Environmental Protection Agency, Washington, D.C.

Filed Feb. 8, 1978, Ser. No. 876,099
Int. Cl.[2] B65D *83/06*
U.S. Cl. 406—152 **15 Claims**



1. A hopper for use in feeding solids stored therein to a

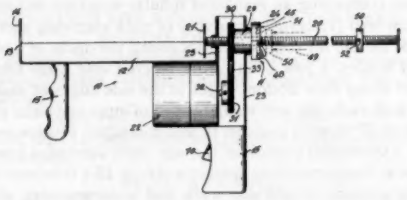
region beneath the hopper in which at least the bottom part is in the form of a hollow, substantially symmetrically right-conical frustum of maximum radius R at the widest (normally upper) end with a substantially circular discharge aperture of diameter D at the narrowest (normally bottom) end, there being at least two substantially V-shaped notches formed in the wall of the frustum substantially symmetrically around the wall of the frustum, the widest ends of the notches being of width b and open to the discharge aperture, and the apices of the notches being remote from the periphery of the aperture at a distance r therefrom, wherein the angle between the wall of the frustum and the axis thereof is no greater than the angle of repose of the solids to be contained in the hopper, r is at least equal to 0.3R and b is at least equal to 0.5D.

4,180,187

AUTOMATIC PISTON DRIVE MECHANISM FOR USE IN CAULKING GUN

Haim Ben-Haim, 4800 Cote St. Catherine Rd., Apt. 17, Montreal, Quebec, Canada

Filed Jun. 30, 1978, Ser. No. 921,046
Int. Cl.[2] B67D *5/46*
U.S. Cl. 222—326 **9 Claims**



1. An automatic piston drive mechanism for use in dispensing flowable compound material through a dispensing orifice of a housing in which said material is contained, said mechanism comprising:

a piston member having an elongated rod and a pusher head;

a drive motor;

a clutch member releasably and threadably connected to said rod, said clutch member having two hinged sections having displaceable abutting faces, a semi-circular channel in each of said faces extending transversely there-across and aligned with one another to constitute a circular bore when said abutting faces are juxtaposed, one of said channels having a thread engaging means in an inner face for threaded engagement with said rod;

said clutch member having a drive connection to said motor and rotatably driven by said motor to impart fixed rotation thereto to effect axial displacement of said rod by its connection whereby said pusher head will advance and apply pressure to said compound to push it through said dispensing orifice.

4,180,188

SEALING STRUCTURE FOR ROTARY VALVES

Tatuo Aonuma, Kashiwa; Michio Kiuchi, Nagereyama; Hirozi Watanabe, and Takeshi Akao, both of Noda, all of Japan, assignors to Kokkoman Shoyu Co., Ltd., Noda, Japan

Filed Nov. 10, 1976, Ser. No. 740,391
Claims priority, application Japan, Nov. 18, 1975, 50-137794; Dec. 2, 1975, 50-160983
Int. Cl.[2] G01F *11/10*
U.S. Cl. 222—368 **2 Claims**

1. A sealing structure for a rotary valve, comprising:

a rotary member provided with a plurality of pockets opening toward the outer periphery of said rotary member;

a casing enclosing the outer periphery of said rotary member;

sealing members provided between the outer periphery of said rotary member and the inner periphery of said casing;

said sealing members being formed to be adjustably projectable in the radial direction;

radial blades partitioning and separating said plurality of pockets provided in said rotary member;

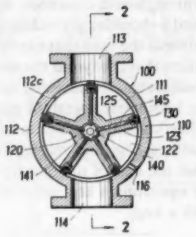
cavities in the outer tips of said blades;

said sealing members being slidably fitted in said cavities to be pressed to project outwardly in the radial direction of said rotary member;

a supporting shaft for said rotary member;

a rod member disposed in one end of said supporting shaft;

a hole formed in the axial direction at the center of said rotary member;



an adjusting member slidably fitted in said hole and advanced and retreated in the axial direction by said rod member advanced and retreated as operated from outside at said one end of said supporting shaft of said rotary member;

said cavities being connected with said hole through passages provided radially within said blades; and

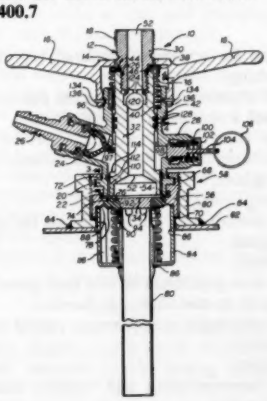
pushing members slidably fitted in said passages to be in contact at one end thereof with the back surface side of said sealing member and at the other end thereof with said adjusting member so that the sealing members may be projected by said pushing members through the sliding of said adjusting member.

4,180,189

SINGLE VALVE DISPENSING TUBE

David Zurit, Tenafly, N.J.; Vincent Cerrato, Pomona, and James Hines, Port Jervis, both of N.Y., assignors to Vending Components, Inc., Hackensack, N.J.

Filed Jan. 11, 1978, Ser. No. 868,492
Int. Cl.[2] B65D *83/00*; B67D *1/04*
U.S. Cl. 222—400.7 **12 Claims**



1. Beer distributing apparatus including in combination a probe fitting that fits into an opening in a keg fitting secured to

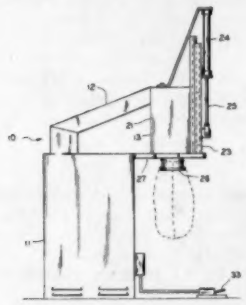
a beer keg or the like, projections extending outward from the probe fitting for engaging cam slots inside the keg fitting for connecting the probe fitting with the outlet through the keg fitting, a probe located within the probe fitting and having up and down movement with respect to both fittings, the probe having a passage for beer opening through the lower end of the probe and extending upward to a hose connection at an upper part of the probe, a gas passage on one side of the probe fitting and opening into the interior of the probe fitting, clearance between confronting cylindrical faces on the inside of a lower portion of the probe fitting and the outside of the probe for flow of gas along said clearance between said cylindrical faces, a seal carried by one of said confronting cylindrical faces and contacting with the other confronting cylindrical face to shut off flow of gas through said clearance when the probe is in a raised position, and a shoulder providing a step on the cylindrical face that confronts the face that carries the seal, said shoulder being in position that is beyond the seal and that leaves said gas passage and said channel unsealed when the probe is in a lowered position, biasing means on the probe fitting for biasing the probe to a shutting raised position off the gas flow when not connected with a keg, and means for moving the probe downward against the bias of the biasing means into said lowered position for operating a keg valve when the probe fitting is connected with a keg.

4,180,190

VACUUM BAG PROCESS AND APPARATUS

Dennis M. Flaum, 1 E. Schiller, Chicago, Ill. 60610, and Herman L. Fleishman, 6518 N. Kenton, Lincolnwood, Ill. 60645

Filed May 13, 1977, Ser. No. 796,756
Int. Cl.[2] A41H *43/00*
U.S. Cl. 223—43 **2 Claims**



1. Apparatus for reversing panelized bag structures, said device comprising:

an enclosed chamber having a bottom panel, a top panel, a front panel, a rear panel, and side panels,

said bottom panel having a passage formed therethrough communicating the interior of said enclosed chamber with the atmosphere;

an upstanding collar,

said collar positioned at said passage on the exterior of said bottom panel;

an access door,

said access door positioned on said front panel to selectively allow access to said enclosed chamber;

means for selectively establishing a partial vacuum within said chamber;

a vacuum duct,

said duct communicating said vacuum means with said chamber; and

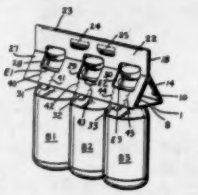
structure to automatically control the opening and closing of said access door and the establishment of said vacuum in a sequence to first close said access door, establish the vacuum, and open said access door at selectable time intervals.

4,180,191

BOTTLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 26, 1978, Ser. No. 926,858
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 BA **4 Claims**



1. A carrier for bottles having flanged neck portions, said carrier comprising an elongated tubular structure including a bottom wall (1) having a plurality of neck receiving apertures (3,4,5) therein for respectively receiving the necks of a plurality of bottles, a pair of inwardly tapered side walls foldably joined along their bottom edges to the side edges of said bottom wall, each side wall being formed of inner and outer panels (8,10,14,27) secured together in face contacting relation over at least a substantial portion of the side walls thereof, a plurality of bottle flange receiving apertures (11-13, 15-17) formed in the upper portions of said side walls and in transversely aligned relationship with said neck receiving apertures respectively, a plurality of single ply downwardly projecting pull tabs (31,32,33) struck from said neck receiving apertures respectively and disposed in coplanar relation with the inner panel of one of said side wall panels (8), a pair of weakened severance lines (34-39) formed in said inner panel of said one of said side wall panels and in general alignment with the side edges of each of said pull tabs, and a pair of weakened severance lines (40-45) formed in the outer panel of said one of said side wall panels (27) associated with said inner panel of said one of said side wall panels and in substantial alignment with each said pair of severance lines formed in said inner panel of said one of said side wall panels so that upward displacement of at least one of said pull tabs severs the material between the severance lines of the outer and inner side wall panels thereby to accommodate removal of a selected bottle.

4,180,192

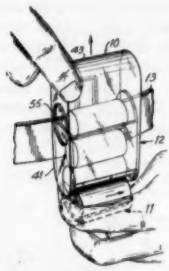
STORAGE AND DISPENSING DEVICE FOR FILM CARTRIDGES OR THE LIKE

Steven M. Breslau, Cranford, N.J., assignor to Pace Photographic Products, Inc., Union, N.J.

Filed May 25, 1978, Ser. No. 909,379
Int. Cl.[2] B65D *42/20, 83/38*
U.S. Cl. 224—235 **8 Claims**

1. Storage and dispensing device for film cartridges or the like comprising an upright magazine for containing a stack of film rolls, said magazine having an upper opening for receiving an uppermost roll and having a lower opening for discharging a lowermost roll, and a cover mounted externally on said magazine for up and down sliding movement between respective open and closed positions to selectively provide access to and block said upper and lower openings, an external protrusion on said magazine, said cover having a cutout opening downardly and slidably receiving therethrough said protrusion

on said cover movement, and snap engageable interfitting formations on said protrusion and cover for releasably retaining the latter in said positions, and mounting means carried by said protrusion for mounting said magazine to a person.



4,180,193

APPARATUS FOR REMOVING THE FORWARD MARGIN OF A SHEET

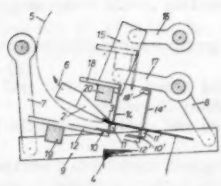
Franz Hennig, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,661

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708510

Int. Cl.[2] B26F *3/02*

U.S. Cl. 225—101 **11 Claims**



1. In an apparatus for separating the forward margin of a sheet which is joined to the forward margin along a parting line only by webs and is held at the forward margin by grippers of a transport and having upper and lower separating tools disposed above and below the parting line and movable with respect to one another, wherein the improvement comprises: an anvil disposed at the underside of the sheet to be separated and means mounting the anvil for movement with respect to the lower separating tool and for co-action with the upper separating tool to form a pair of gripper jaws for the sheet which is movable with the gripped sheet with respect to the lower separating tool during the separating action comprising means mounting the anvil and the lower separating tool commonly on a beam and a double crank for carrying the beam to move the anvil and the lower separating tool into and out of the path of movement of the grippers.

4,180,194

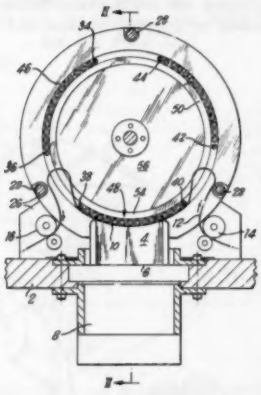
WEB TRANSPORT MECHANISM AND METHOD

Alan K. McCombie, and Stephen Temple, both of Cambridge, England, assignors to Cambridge Consultants of Bar Hill, Cambridge, England

Filed Dec. 30, 1977, Ser. No. 866,003

Int. Cl.[2] B65H *17/42*

U.S. Cl. 226—113 **42 Claims**



18. A mechanism for transporting a web through a work zone and holding successive portions of said web stationary in said work zone during intermittent work periods, comprising:

(a) a support member having a web support surface in said work zone;

(b) clamping means having a clamping surface and at least one gap therein;

(c) means for moving said clamping means around an endless path so that said clamping surface said clamping surface traversing said support surface during said work periods and said gap traversing said support surface during intervening periods and said gap alternately traverse said support surface, said clamping surface being adapted when traversing said support surface to cooperate with said support surface to clamp a portion of the web therebetween to thereby hold said web portion stationary with respect to said support surface, said clamping surface having a length in the direction of movement of the clamping member not less than the length of said work zone in said direction so that said clamping is effective throughout each of said work periods;

(d) supply means for supplying web to an input zone upstream of said support surface for forming a first loop of said web in said input zone, said clamping means being arranged to receive said first loop in said gap as said gap approaches said support surface and to transfer said loop across said support surface so that the portion of web previously clamped in said work zone is transferred to an input zone downstream of said support surface in the form of a second loop and web from said first loop is transferred into said work zone; and

(e) take-up means for removing web from said second loop.

4,180,195

RIVET DELIVERY AND LOCATING APPARATUS

Kenneth E. Caley, Seattle, and Brian R. Trethewy, Snohomish, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 16, 1978, Ser. No. 869,966

Int. Cl.[2] B27F *7/04*

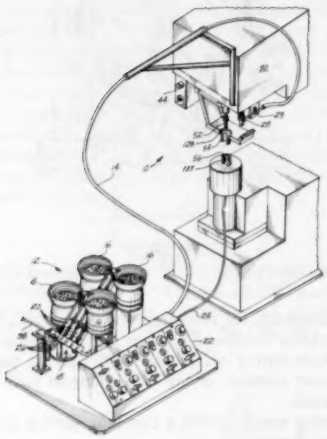
U.S. Cl. 227—51 **21 Claims**

1. In a riveting apparatus including supply means for providing orientated rivets each having both a head portion and a

shank portion and means for performing a heading operation on said rivets; improved means for delivering and locating said rivets for said heading operation, said improved means comprising:

a delivery tube including a discharge end and defining a conduit through which rivets received from said supply means are propelled to said discharge end;

gripping means for receiving said rivets from said discharge end and gripping said rivets, said gripping means including a plurality of gripping surfaces and operable to a



receiving mode with said surfaces spaced apart a distance sufficient to admit the shank portion but not the head portion of an individual rivet therebetween and a gripping mode with said surfaces biased into gripping contact against said shank portion;

operating means for operating said gripping means to said receiving mode prior to said individual rivet leaving said discharge end and to said gripping mode after said individual rivet has been received by said gripping means; and

means for positioning said gripping means for locating said individual rivet for said heading operation.

4,180,196

ANVIL ATTACHMENT FOR A SURGICAL STAPLING INSTRUMENT

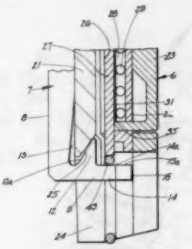
J. Charles Hueil, Loveland, Ohio; Robert G. Rothfuss, Bellevue, Ky., and Terry A. Boothby, Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 5, 1977, Ser. No. 822,049

Int. Cl.[2] B25C *5/02*

U.S. Cl. 227—109 **9 Claims**

1. An anvil attachment for the nose portion of a surgical stapling instrument of the type utilizing a replaceable cartridge of surgical staples, said anvil attachment having a first leg configured to lie along and to be attached to said surgical stapling instrument nose and a second leg extending from said first leg at an angle thereto, said second leg having two or more anvil portions about which said surgical staples are formed, each anvil portion being of a width equal to the inside crown dimension of a fully formed staple, and each of said anvil portions having an upper surface comprising a anvil surface



adapted to abut and support the crown of a surgical staple during a staple forming operation.

4,180,197

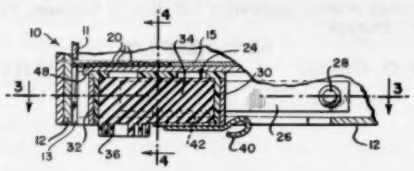
STAPLING AND MARKING DEVICE

Ernest M. Raasch, Alpine, N.J., and Nathaniel M. Olney, New York, N.Y., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,864

Int. Cl.[2] B25C *5/02, 7/00*

U.S. Cl. 227—120 **7 Claims**



1. A stapling and marking device, comprising:

(a) anvil means;

(b) a housing having a front portion disposed over said anvil means;

(c) staple supporting means disposed in said housing for supporting a plurality of staples;

(d) means for urging said staples toward the front of said housing;

(e) means for driving said staples into a workpiece;

(f) marking means for marking a workpiece during stapling of the same; and

(g) means for supporting said marking means within said housing underneath and within said staple supporting means.

4,180,198

APPARATUS FOR INSERTING STICKS INTO ARTICLES

Thomas F. Lowrance, 3601 Security St., Garland, Tex. 75040

Filed Mar. 13, 1978, Ser. No. 886,269

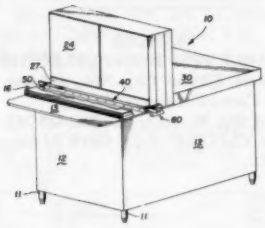
Int. Cl.[2] B27F *7/00;* **B23Q** *7/10*

U.S. Cl. 227—120 **8 Claims**

1. In apparatus for inserting elongated sticks into articles, wherein the apparatus includes: an article holder having means for retaining a plurality of articles in spaced side-by-side relation; a stick box having a plurality of elongated stick feed grooves disposed in spaced, parallel side-by-side relation, in generally horizontal longitudinal alignment with the respective article retaining means of said article holder, and means for supporting sticks overlying each feed groove for sequential feeding into each feed groove; means for pushing sticks disposed in said feed grooves longitudinally out of said grooves and partially into said article retaining means; and a stick

holder comprising an elongated body removably positionable between said stick box and said article holder, said stick holder having a plurality of stick passage means disposed in side-by-side relation for generally horizontal alignment with respective feed grooves of said stick box and with respective retaining means of said article holder; said stick holder having stick clamping means for clamping sticks in said passage means; and a support surface for said stick holder adjacent to said stick box; the improvement comprising:

at least one leg mounted on said stick holder body and projecting transversely therefrom adjacent to one end; a



guide block mounted on said apparatus providing a horizontal support surface for said leg; said guide block support surface and said projecting leg defining means for preventing rotation of said stick holder about its longitudinal axis;

coacting means on said apparatus and on said stick holder for limiting forward and rearward movement of said stick h der relative to said apparatus;

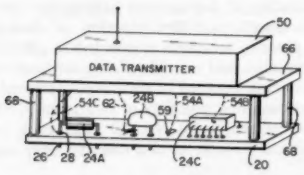
and coating means on said apparatus and on said stick holder for limiting lateral movement of said stick holder relative to said apparatus.

4,180,199

MASS SOLDERING CONTROL SYSTEM

Harold T. O'Rourke, Milford, and Warren G. Abbott, Londonberry, both of N.H., assignors to Hollis Engineering, Inc., Nashua, N.H.

Filed Feb. 27, 1978, Ser. No. 881,435
Int. Cl.[2] H05K *3/34;* B23K *3/00*
U.S. Cl. 228—102 **22 Claims**



1. In combination with a mass soldering machine having a solder base adapted to contain a mass of molten solder and conveyor means for transporting a circuit board past said solder base whereby to contact said circuit board at least in part with molten solder in said base, a data sensor and wireless transmitter for carrying on top of the circuit board, said data sensor being adapted to provide a signal as a function of the dwell time said board or a component carried on said board is in contact with said molten solder, and a remote receiver tuned to the frequency of said transmitter.

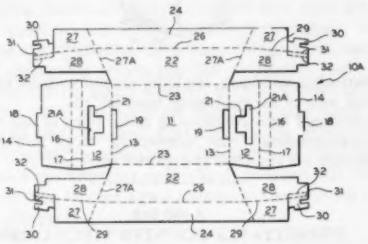
12. In a method of monitoring a component carrying printed circuit board through a mass soldering operation in contact with a mass of molten solder, the steps of: (1) providing (A) a data sensor and a wireless transmitter for carrying on a board being processed, and (B) a remote receiver tuned to the frequency of said transmitter; (2) attaching said data sensor to said board or a component carried on said board; (3) generating a signal as a function of the dwell time said board or said component is in contact with said molten solder, and (4) wireless transmitting said signal to said remote receiver.

4,180,200

LOCKABLE TRAY

James R. Wilkinson, Sr., Abingdon, Md., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 30, 1978, Ser. No. 965,032
Int. Cl.[2] B65D *5/22*
U.S. Cl. 229—32 **2 Claims**



1. A tray formed from a cut and scored blank of paperboard or the like comprising:

(a) a rectangular bottom;

(b) a pair of opposed end walls foldably connected to opposite ends of said bottom including an inner and an outer end wall panel foldable with respect to each other and into a locking engagement with said bottom;

(c) a pair of opposed side walls having side panels foldably connected to opposite edges of said bottom and including a rim flange foldable with respect to each side wall panel into a position along the outer face of said side wall panel;

(d) flaps foldably connected to each end of said rim flange and said side wall panel and foldable into position against said end walls;

(e) a hand receiving opening formed in said end walls and including locking slots extending therefrom;

(f) a locking tab hinged to an edge of at least one of said flaps at each of said rim flange and folded against said outer end wall panel and extending into said locking slots to secure said side walls to said end walls.

4,180,201

PACK AND BLANK FOR MAKING THE PACK AND WEB OF PACKING MATERIAL FOR MAKING THE BLANKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany

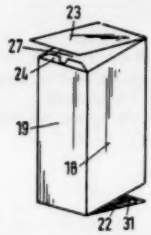
Division of Ser. No. 744,359, Nov. 23, 1976, Pat. No. 4,072,263.
This application Nov. 8, 1977, Ser. No. 849,582
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1976, 2600822
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—37 R **12 Claims**

1. A block shaped package formed from a blank having four laterally edge joined sidewalls defining two opposed pair of sidewalls, said blank also having opposed end walls, said end walls being made up by terminal flaps integral with and extending from respective sidewalls, said terminal flaps being of of unequal length and being folded into the plane of the end walls, said package blank thereby having two inside sidewalls and outside sidewalls on opposite sides thereof, one terminal flap situated on the outside, covering up the entire end of said pack, the improvement wherein:

both end walls of the package are developed essentially equal,

all terminal flaps are of rectangular shape, and

the terminal flaps of both end walls are attached to the sidewalls at respective ends thereof and are dimensioned in such a way, that as a result of the dovetailed position of the terminal flaps of one blank with the terminal flaps of



two adjacent blanks, the latter are cut without waste from one web of the packaging material, and

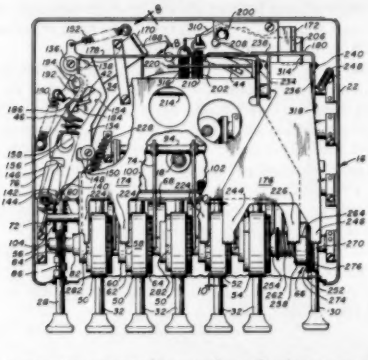
the terminal flaps constituting cover flaps of one blank and correspondingly the connecting strips corresponding thereto are disposed at opposite sidewalls.

4,180,202

PRESETTABLE COUNTER MECHANISM

Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 576,241, May 12, 1975, Pat. No. 3,988,576. This application Oct. 21, 1976, Ser. No. 734,601
Int. Cl.[2] G06C *15/42*
U.S. Cl. 235—132 R **18 Claims**



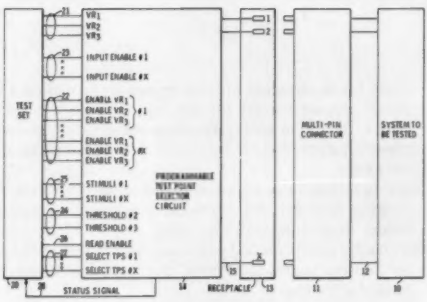
1. In a counter operated control mechanism comprising a rotatable control member, means urging said control member in a first angular direction, release means movable between a first position releasably latching said control member against movement in said first angular direction and a second position permitting its rotation in said direction, a counter controlling movement of said release means, and shiftable trip means for permitting movement of said release means to said second position in response to a reference count on said counter, the combination wherein said release means includes first and second release latches respectively movable between first operative and second withdrawn positions, said first release latch being operative in its said first operative position to latch said rotatable control member at a first angular position thereof and in its said second withdrawn position to permit rotation of said control member in said first angular direction, said second release latch being operative in its said first operative position to latch said rotatable control member at a second position angularly spaced in said first angular direction from said first angular position and in its said second withdrawn position to permit rotation of said control member in said first angular direction; said counter including first and second cam assemblies having trip controlling cam surfaces, said shiftable trip means including separate first and second shiftable trip members having cam followers for engaging said cam surfaces, said first trip member cam follower operatively engaging said first cam surface while said first release latch is in its first operative position and being shiftable in response to said first cam surface to permit movement of said first release latch to its said withdrawn position upon said counter reaching a first reference count and said separate second trip member cam follower operatively engaging said second cam surface upon movement of said first release latch out of its first operative position and being shiftable in response to said second cam surface to permit movement of said second release latch to its said withdrawn position upon said counter reaching a second referenced count.

4,180,203

PROGRAMMABLE TEST POINT SELECTOR CIRCUIT

Harvey M. Masters, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1977, Ser. No. 838,262
Int. Cl.[2] G06F *11/04*; G01R *31/00*
U.S. Cl. 235—302 **2 Claims**



1. A programmed circuit for selectively coupling a multi-bit digital signal to a plurality of circuit nodes and for determining the status of signals present at said nodes; comprising:

(a) a plurality of input circuits, each of said input circuits selecting which ones of said nodes the bits of said digital signal will be coupled to and generating a bit of said digital signal, each of said input circuit comprising a first plurality of two input AND gate circuits having their respective output terminals coupled to a plurality of voltage sources by a first plurality of resistors;

(b) a first plurality of diodes each having first and second polarity terminals, said first plurality of diodes having their first polarity terminals connected in parallel and to one of said nodes, said second polarity terminal of each of said diodes being coupled to the output terminal of separate ones of said first plurality of two input AND gates;

(c) a plurality of two input NAND gates each having its output coupled directly to said one and only one of said nodes;

(d) a threshold detector circuit;

(e) a second plurality of diodes each having first and second polarity terminals, said second plurality of diodes having their second like polarity terminals connected in parallel and to the input of said threshold detector;

(f) a second plurality of resistors each having first and second terminals, each of said second plurality of resistors having its first terminal coupled to one and only one of said terminals of said first polarity of said second plurality of diodes, said second terminal of each of said second plurality of resistors being coupled to one and only one of said nodes;

(g) a second plurality of two input AND gates, each of said second plurality of AND gates having its output terminal coupled to the junction formed by separate ones of said second plurality of diodes and said second plurality of resistors, with the inputs of said first and second plurality

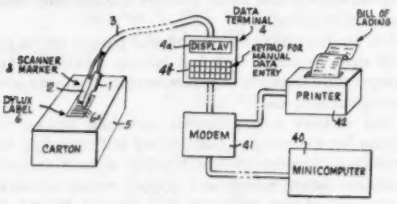
of AND gates and the input to said NAND gate coupled to receive a digital program signal which specifies to which ones of said circuit nodes the bits of said digital signal will be coupled and which one of said nodes will be coupled to the input of said detector to determine the status of the signal thereon.

4,180,204

AUTOMATIC INVENTORYING SYSTEM

Richard W. Koenig, Menomonee Falls; Philip R. Girard, Shorewood, and Alfred J. Neuhauser, Wales, all of Wis., assignors to The J. C. Penney Corporation, Inc., New York, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,879
Int. Cl.[2] G06F *15/84*; G06K *7/12, 19/06*
U.S. Cl. 235—385 **22 Claims**



1. A method for providing a visible verification of the performance of an inventory operation on an item comprising the steps of:

disposing on the surface of an item to be inventoried information relating to said item in combination with a photosensitive material which undergoes a visible change upon being irradiated with appropriate light;

performing an inventory operation on said item by recording the information relating to said item; and

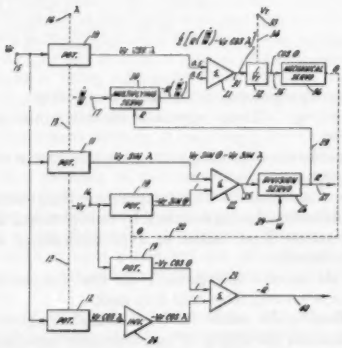
upon the completion of the recordation of said information, producing a visible change in the photosensitive material by irradiating said material with said appropriate light to verify the performance of the recording step on the item.

4,180,205

PSEUDO RANGE AND RANGE RATE DEVICE

Arnold Schwartz, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1962, Ser. No. 179,529
Int. Cl.[2] F41G *7/00*
U.S. Cl. 235—411 **10 Claims**



1. An electrical circuit for the simultaneous solution of three equations comprising:

three ganged potentiometers coupled to receive a common first voltage signal and to be driven by a first angular driving means;

a pair of ganged potentiometers coupled to receive a common second voltage signal and to be driven by a second angular driving means;

summing networks coupled to the outputs of each of two of said three ganged potentiometers and an output of each of said pair of said ganged potentiometers, respectively, to produce first and second sum voltage signals on outputs thereof, and a summing network coupled to the output of one of said three ganged potentiometers and the output of one of said first and second summing networks to produce a third sum voltage signal on an output thereof;

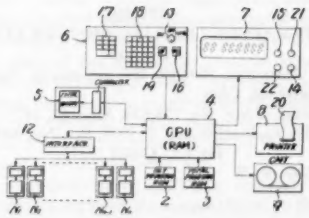
attenuating means coupled to attenuate said third sum voltage signal in accordance with a third angular driving means, the attenuated third sum voltage signal output of said attenuating means coupled to control said second angular driving means whereby the first, second, and third angular drive means and the various voltage signal inputs coupled and arranged aforesaid provide three simultaneous equations of analog voltages in said three potentiometers and summing networks to produce said first and second sum voltage signal outputs as the solution in analog voltages.

4,180,206

MERCHANDISE SALES CONTROL SYSTEM

Yasuyoshi Takahashi; Shigeo Sekiguchi, and Teruyoshi Sato, all of Tagata, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 811,124
Claims priority, application Japan, Jun. 30, 1976, 51-78350
Int. Cl.[2] G06K *15/00, 15/02*
U.S. Cl. 235—419 **10 Claims**



1. A merchandise sales control system comprising a plurality of memory cassettes each having at least a recording section composed of a unit-price setting section and a sales data section, a unit-price writing device able to removably connect to said memory cassettes and to preset a number of commodity unit prices in the unit-price setting section of each of said memory cassettes, a plurality of electronic cash registers able to removably connect to said memory cassettes, and a totalling device able to removably connect to said memory cassettes, wherein said memory cassettes are connected to said unit-price writing device which presets a number of commodity unit prices in the unit-price setting section of said memory cassettes, then the memory cassettes are connected to said electronic cash registers respectively to perform sales registration so that sales data based on the commodity unit prices stored in said unit-price setting section are registered in said sales data section, and then said memory cassettes in which the sales data are registered are removed from said electronic cash registers and are connected to said totalling device which totals the sales data stored in said electronic cash registers.

4,180,207

SECURITY MATERIAL AND SECURE DOCUMENT SYSTEM USING SAID MATERIAL

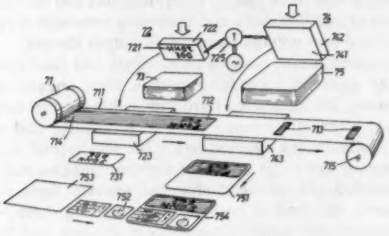
Cyril A. Lee, Littlewick Green, England, assignor to E M I Limited, Hayes, England

Filed Dec. 9, 1977, Ser. No. 859,234

Claims priority, application United Kingdom, Dec. 10, 1976, 51628/76; Apr. 27, 1977, 17499/77

Int. Cl.[2] **G06K** *19/08;* **G09F** *3/02;* **G06K** *7/08;* **G11B** *11/10*

U.S. Cl. 235—493 **19 Claims**



1. A method of applying security material to a support in a form which represents information including

providing a source of selectively releasable security material having a security feature of a detectable pattern of a magnetic material property,

applying a data recording element to the security material source to release material from the source in the form of said element,

securely bonding at least one of the released material form and the matching remaining material form in the source to a respective support,

thereby to produce a secure document having data securely represented by the material form on the support, the material itself including said security feature.

4,180,208

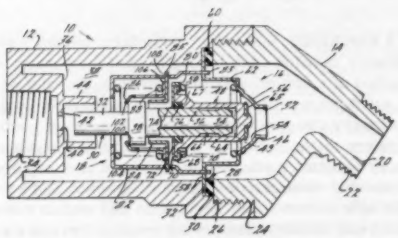
TEMPERATURE LIMITING SHOWER CONTROL VALVE

Frank E. Obermaier, Bartlett, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 778,634, Mar. 17, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,520

Int. Cl.[2] **G05D** *23/12*

U.S. Cl. 236—93 B **5 Claims**



1. A valve assembly for limiting the temperature of fluid passing therethrough and adapted to be carried in a housing fluidly intermediate an inlet port and an outlet port thereof, the valve assembly comprising:

(a) bracket means adapted to be secured to said housing, said bracket means including,

(i) a valve seat means defining a first self centering surface,

(ii) retainer means defining a second self centering surface, said second self centering surface being substantially axially aligned with said first self centering surface;

said retainer means being movable with respect to said bracket means;

(b) poppet means disposed adjacent said valve seat, said poppet means having a valve surface thereon;

(c) temperature sensitive means mounted within said bracket means and having an actuator extending therefrom and connected to said poppet means and a reaction surface thereof seated against said second self centering surface, said temperature sensitive means being operative to move said poppet means in response to a predetermined fluid temperature value from an open position in which said valve surface is spaced from said valve seat for permitting flow therethrough to a closed position in which said valve surface of said poppet means contacts said first self centering surface of said valve seat for substantially blocking flow therethrough;

(d) first biasing means for biasing said poppet means toward said open position, said first biasing means urging said temperature sensitive means toward said second self centering surface; and

(e) said retainer means further including second biasing means for maintaining said second self centering surface stationary relative to said housing as said temperature sensitive means moves said poppet means between said open and closed positions, said second biasing means permitting further movement of said temperature sensitive means as fluid temperatures above said predetermined value are sensed.

4,180,209

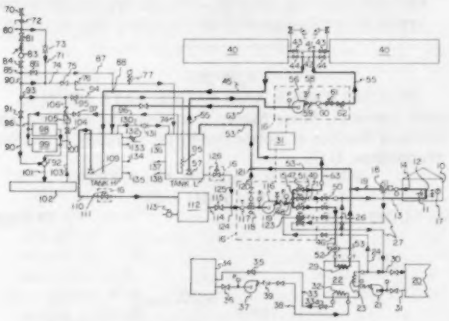
SOLAR ENERGY OPERATED SYSTEM AND METHOD

Joseph R. Frissora, Corning, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 28, 1977, Ser. No. 837,495

Int. Cl.[2] **F24J** *3/02*

U.S. Cl. 237—1 A **20 Claims**



1. A solar energy operated system comprising

a solar energy collector apparatus including inlet and outlet thereto,

a fluid media for absorbing solar energy as heat in the collector apparatus,

a first storage tank for high temperature fluid media,

a heat utilization device operable by heat obtained from high temperature fluid media at a predetermined operating temperature,

a separate second storage tank for low temperature fluid media separated from said first tank,

a first fluid media circuit for flow of high temperature fluid media from the output of said collector apparatus to said first tank,

a second fluid media circuit for flow of high temperature fluid media from said first tank through the heat utilization device and to said second tank,

a third fluid media circuit from said second tank to the inlet of said collector apparatus and connected to the first fluid media circuit through said collector apparatus, and

a pump means in the system operable to circulate high temperature fluid media at said predetermined operating temperature from said first tank to the heat utilization device for operating the latter, and from the heat utilization device at reduced temperature to said second tank, said pump means also being operable for moving low temperature fluid media from said second tank to the inlet of the collector apparatus and displacing high temperature fluid media in said collector apparatus into said first circuit for flow to said first tank.

4,180,210

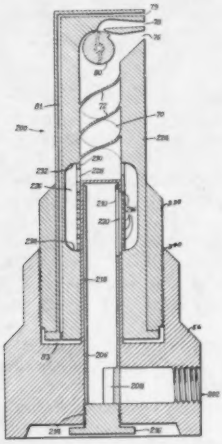
WATER SPRINKLER

Robert E. DeWitt, 49 Sherwick Rd., Oswego, Ill. 60543

Filed Apr. 5, 1978, Ser. No. 893,268

Int. Cl.[2] B05B *3/00*

U.S. Cl. 239—97 **34 Claims**



1. A water sprinkler for distributing water in a predetermined pattern, comprising:

an inlet port for receiving water;

a rotatable outlet port;

a flow regulator disposed to receive water from said inlet port and pass a regulated flow of water to said outlet port, said flow regulator including:

means defining a plurality of vertically spaced, circularly extending, pattern-defining apertures for passing a flow of water therethrough, a first of said pattern-defining apertures being contoured to develop a first pattern of water coverage, and at least a second of said pattern-defining apertures being contoured to develop, in combination with said first pattern-defining aperture, a second composite pattern of water coverage, and

sampling means defining at least one pattern-sampling aperture contoured to permit simultaneous communication with a plurality of said pattern-defining apertures, said pattern-defining apertures and said sampling aperture being disposed such that at least a substantial portion of the water from said inlet port is constrained to flow through at least a selected one of said pattern-defining apertures and said sampling aperture in route to said outlet port;

means for effecting relative motion between said pattern-sampling apertures and said pattern-defining aperture to sample successive portions of said selected pattern-defining apertures in synchronism with the rotation of said outlet port; and

vertically movable pattern selection means for modifying the pattern of water coverage from a condition wherein water from the inlet port flows through said pattern-sampling aperture and said first pattern-defining aperture to a condition wherein water flows from the inlet port through said pattern-sampling aperture and said first and second pattern-defining apertures,

whereby the sampling of successive portions of said selected pattern-defining apertures by said sampling aperture causes the flow of water from the exit port to develop a water pattern coverage related to the patterns of said selected pattern-defining apertures, and the pattern of water coverage is variable between the first pattern and the second composite pattern.

4,180,211

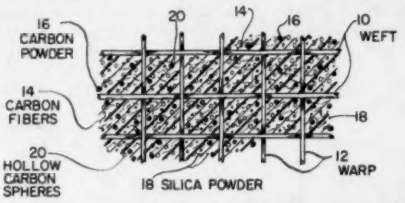
HIGH TEMPERATURE COMPRESSIBLE SUPPORT AND GASKET MATERIAL

Eugene L. Olcott, Falls Church, Va., and Edwin F. Abrams, Silver Spring, Md., assignors to Versar, Inc., Springfield, Va.

Filed May 30, 1974, Ser. No. 474,399

Int. Cl.[2] B64C *15/06*

U.S. Cl. 239—265.43 **6 Claims**



1. A high-temperature gasket material for filling and sealing a volume-limited space, the gasket material being crushable under high loading without requiring the exit of material from said space, comprising:

(a) a binder material of a type which pyrolyzes to leave a carbonaceous char which retains substantial strength, the binder material comprising 15 to 30% by weight of the gasket material and the binder material being selected from a group including phenolics, polyimides and furanes;

(b) crushable filler material in said binder comprising hollow carbon microspheres whose diameters fall within the range of 5 to 150 microns and whose wall thicknesses approximate several microns; and

(c) other filler materials in said binder and fully occupying the interstices between the microspheres so that substantially the only voids in the uncrushed gasket material are within the microspheres.

4,180,212

HIGH SPEED ROTARY KNIFE AND BLADE INSERT ASSEMBLY THEREFOR

Walter R. Witte, Des Plaines, Ill., assignor to Speco, Inc., Schiller Park, Ill.

Filed Aug. 21, 1978, Ser. No. 935,531

Int. Cl.[2] B02C *18/18*

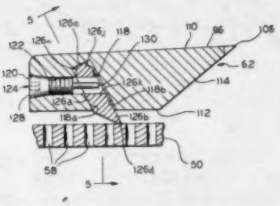
U.S. Cl. 241—89.4 **16 Claims**

1. In a high speed rotary knife adapted in operation to rotate adjacent to a perforated plate for severing foodstuff projecting from the plate perforations, said knife including a holder component and a blade held thereby, said holder component defining an arcuate-bottom slot, said blade having a longitudinally extending cutting edge and a longitudinally arcuate base, said slot receiving said blade seated therein with its base at the bottom of the slot in conformity thereto, said base being adjustable on said holder component by rotational sliding movement on its base for leveling its cutting edge with respect to said

plate, and said blade traversing said plate with said cutting edge thereagainst in operation, improved means for mounting said blade comprising:

means defining a hole extending transversely in said blade from a side thereof,

an arbor extending into said hole from said side, said arbor fitting loosely in said hole for retaining said blade in said



slot while enabling the blade to rock about a transverse axis for automatically leveling the blade with respect to said plate during assembly with the plate and operation, and

means for mounting said arbor on said holder component while enabling the arbor to be withdrawn from said hole sufficiently to release said blade for replacement thereof.

4,180,213

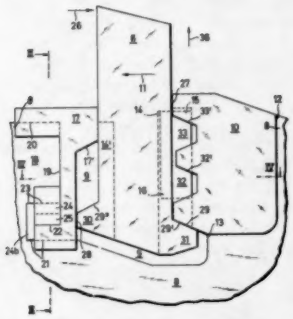
ROTOR OF A COARSE-REDUCTION IMPACT CRUSHER

Makoto Endo, Yokohama, Japan, assignor to Matsuzaka Company Ltd., Japan

Filed Apr. 12, 1978, Ser. No. 895,596

Int. Cl.[2] B02C *13/28*

U.S. Cl. 241—192 **12 Claims**



1. A rotor for a coarse reduction impact crusher with exchangeable blow bars comprising in combination:

a rotor disk to be driven in rotation having a plurality of radially facing recesses on the periphery;

a supporting element on the trailing side of said recesses secured to the rotor;

a circumferentially rearwardly extending projection on the leading side of said recesses;

a removable shoe in said recess embracing said projection on both lateral sides and on the radially inwardly facing side;

clamping keys securing said shoe to said disk; and

a blow bar in said recesses clamped therein between shoe and said supporting element so that the shoe can be removed by removal of said clamping keys for removal and replacement of said bar.

4,180,214

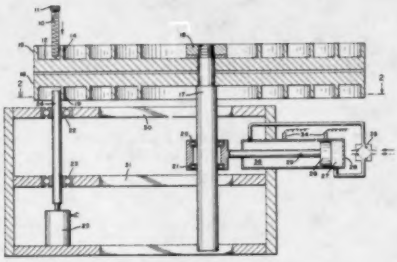
CARTRIDGE TAKEUP APPARATUS

Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Robin B. Mumford, Colts Neck, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 6, 1978, Ser. No. 966,987

Int. Cl.[2] B65H *54/76*

U.S. Cl. 242—47 **9 Claims**



1. A takeup apparatus for packaging yarn plugs comprising:

(a) a cartridge adapted for receiving yarn plugs from a yarn texturizer and having a storage groove formed by a spiral wall;

(b) a support for the base of said cartridge, said support having a spiral wall extending downward, the shape of said support spiral wall corresponding substantially to the shape of said cartridge spiral wall;

(c) a shaft upon which said support is mounted;

(d) means for driving said support around said shaft by contacting the spiral wall of said support with a driving means;

(e) means for applying a lateral force to said shaft to hold the spiral wall of said support in non-slip contact with said driving means;

(f) means for sensing the lateral position of said support; and

(g) means for changing reversibly the direction of said lateral force such that the contact point of the driving means shifts from a point on the inside of the support spiral wall to a point on the outside of the support spiral wall.

4,180,215

THREAD STORAGE AND SUPPLY ARRANGEMENT FOR TEXTILE MACHINES

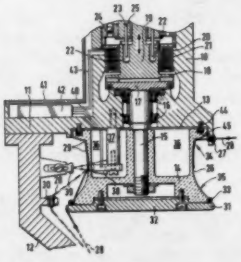
Siegfried Nürk, Albstadt, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs- und Beteiligunsgesellschaft mbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,376

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743749

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.01 **8 Claims**



1. In a thread storage and supply arrangement for textile

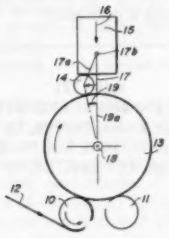
machines, in combination, a storage drum having a peripheral thread storage surface onto which is to be wound a succession of adjoining turns of thread, the thread storage surface comprising a thread infeed region at one axial end of the storage surface and a thread outfeed region at the other axial end; thread infeed means located at the thread infeed region for feeding onto the peripheral storage surface a succession of adjoining turns of thread; thread outfeed means located at the thread outfeed region for feeding off the storage surface thread which is to be pulled off the storage drum, the peripheral storage surface at the thread infeed region thereof curving radially inward in the direction from the infeed region to the outfeed region and at the outfeed region thereof curving radially outward in the direction from the infeed region to the outfeed region, the diameter of the peripheral storage surface being greater at the part of the thread outfeed region remote from the infeed region than at the thread infeed region; controllable drive means operative when activated for effecting rotation of the storage drum relative to the infeed and outfeed means; and electrooptical control means operative for activating and deactivating-the drive means in dependence upon the extent to which thread is wound about the peripheral storage surface of the storage drum.

4,180,216

WINDER WITH HORIZONTAL RIDER ROLL ADJUSTMENT

Carl B. Dahl, Rockton, Ill., and Jere W. Crouse, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 12, 1978, Ser. No. 895,598
Int. Cl.[2] B65H *17/12*
U.S. Cl. 242—66 **7 Claims**



1. In a winder for winding a continuous traveling web, the combination comprising:

first and second cylindrical winder drums rotatable in the same direction on horizontal parallel axes for supporting a roll being wound thereon;

a rider roll initially positioned centrally above the winder drums for engaging the surface of the wound roll and applying a generally downwardly directed force thereto;

a stationary beam means for supporting the rider roll above said roll to be wound at a fixed distance from said beam means and applying the downward force;

and means for continuously changing the location of said rider roll circumferentially relative to the wound roll axis during winding to compensate for the changing spring constant of the wound roll and reducing the vibration thereof,

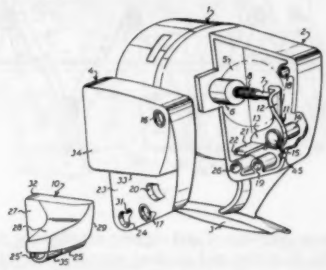
said location changing means being supported on said beam and maintaining the rider roll centrally located with respect to the drums at the beginning of the winding operation and moving the rider roll laterally relative to the beam along the surface of the wound roll to a final position at an angle from the center of the wound roll as the size of the wound roll increases.

4,180,217

FISHING REELS FOR RETAINING THE LINE DURING CASTING

Kurt J. S. Harre, Karlshamn, and Kent A. Tufvesson, Asarum, both of Sweden, assignors to ABU Aktiebolag, Svangsta, Sweden

Continuation of Ser. No. 759,357, Jan. 14, 1978, abandoned. This application Jul. 10, 1978, Ser. No. 923,431
Claims priority, application Sweden, Jan. 22, 1976, 7600629
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.2 A **5 Claims**



1. A fishing reel having forward and rear portions with a line spool at the forward portion and a foot at the bottom of the fishing reel connecting the fishing reel to a fishing rod, and comprising

a gear casing at the rear portion of the fishing reel connected to the line spool;

transmission elements in said gear casing;

a thumb-operable knob having an operating surface and a hollow portion and pivotally mounted on said gear casing on a pivot having its pivot axis located at a level between the longitudinal axis of the line spool and the location of the foot and said pivot axis located near the bottom of said knob;

said transmission elements including

a push rod slidably guided in the fishing reel between a position toward the forward portion of the reel and a position toward the rear portion of the reel,

bell crank means pivotally mounted in said casing and having two arms with one of said arms positioned to actuate said push rod into a forward position by application of pressure on said push rod in the longitudinal direction thereof,

a projection on the other of said arms extending into said hollow portion of said knob and positioned below said operating surface of said knob for operation thereon by said knob to pivot said bell crank means against said push rod by pivoting of said knob about is pivot axis by application of thumb pressure to its said operating surface in a same direction as the direction of movement of a point of contact between said knob and said bell crank means,

and in the forward position of said push rod, a straight line between said pivot axis of said thumb-operable knob and the pivot axis of said bell crank mens forming an angle of approximately 90° in relation to a straight line between the pivot axis of said bell crank means and a point of application of pressure by said one of said arms of said bell crank means on said push rod.

4,180,218

CREEL

David R. Jacobs, New Canaan, Conn., assignor to Abram N. Spanel, Princeton, N.J.

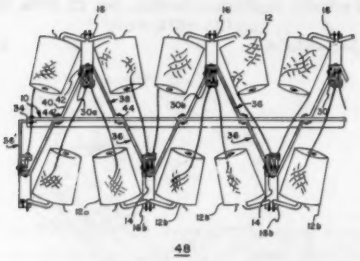
Filed Feb. 14, 1978, Ser. No. 877,632
Int. Cl.[2] B65H *49/02*
U.S. Cl. 242—131 **21 Claims**

1. A creel for yarn bobbins, comprising:

a plurality of support members disposed in at least two adjacent rows;

means for mounting at least one bobbin on each side of said support member;

means on at least one of said support members in the first row for receiving and guiding yarn from at least one of said bobbins mounted on said support members in the second row; and,



48

means on at least one of said support members in the second row for receiving and guiding yarn from at least one of said bobbins mounted on said support members in the first row.

4,180,219

LAP CREEL COMPRISING ROD SHAPED CARRIER ELEMENTS

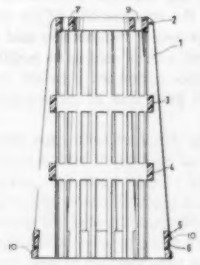
Josef Becker; Hubert Becker, and Matthias Becker, all of Niederforstbacher Str. 80-84, 5100 Aachen-Brand, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,546

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730876

Int. Cl.[2] **B65H** *75/20, 75/28*

U.S. Cl. 242—118.1 **6 Claims**



1. A lap creel comprising rod shaped carrier elements **(1)** each having a cross-section with a long axis of given length and a short axis of a length less than said given length of said long axis, and holding means **(2, 3, 4, 5)** for said carrier elements **(2)** to form with said carrier elements a cage having a longitudinal, central axis from which said long cross-section axes extend radially, said carrier elements **(1)** having a substantially right-angled triangular shape and radially outwardly facing longitudinal edges forming the hypotenuse of the respective triangle whereby these edges extend at an acute angle relative to said central axis of said cage whereby the latter has a conical outer configuration and a cylindrical inner configuration, said lap creel having one end of largest diameter and an opposite end of smallest diameter, said holding means comprising at least one first holding element **(5)** at said largest diameter end and at least one second holding element **(2)** at said smallest diameter end, said first and second holding elements **(5, 2)** being so positioned that said carrier elements extend radially inwardly at said largest diameter end in the area of the respective first holding element **(5)** and radially outwardly at said smallest diameter end in the area of the respective second holding element, whereby said lap creel is insertable coaxially into another lap creel of the same construction to a definite proportion of its height.

4,180,220

TAPE CASSETTE

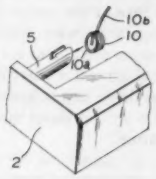
Haruo Shiba, and Takateru Sato, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,580

Claims priority, application Japan, Oct. 28, 1977, 52-144801[U]

Int. Cl.[2] **G03B** *1/04*

U.S. Cl. 242—199 **4 Claims**



1. In a tape cassette having a cover for covering a wound tape which comprises a polar member mounted on a wall of the cover and a spring fitted to the polar member, an improvement characterized in that the polar member has a narrow width slit at the free end and a wide width slit adjacent to the narrow width slit at the side of the fixed end and one end of the spring is inserted into the wide width slit and the other end of the spring is contacted with a case body.

4,180,221

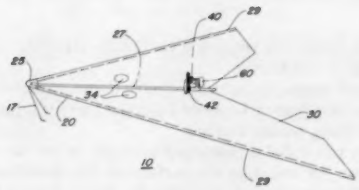
SELF PROPELLED KITE

Donald E. Harris, Star Route, Payette, Id. 83661

Filed Jan. 16, 1978, Ser. No. 869,695

Int. Cl.[2] **B64C** *39/00*

U.S. Cl. 244—13 **4 Claims**



1. Self propelled kite apparatus comprising:

a frame including a nose piece, a stringer backwardly extending from the nose piece and two spars attached to the nose piece, equidistant and upwardly and outwardly diverging from the stringer;

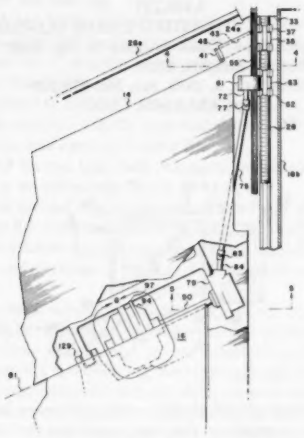
a fairing connected to and extending between the spars beneath said stringer, said fairing being fabricated from flexible sheeting material including a pair of longitudinally extending, divergent ducts, each duct adjacent an outer terminal edge of said fairing and adapted to receive one of the spars;

propulsion means mounted to the stringer above the fairing and said fairing defining at least one air intake port forward of said propulsion means;

4,180,222
AILERON SEGMENT CONTROL FOR A FLAPERON SYSTEM

Francis L. Thornburg, Canoga Park, CA, assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 27, 1976, Ser. No. 754,823
Int. Cl.[2] B64C 9/06, 9/12
U.S. Cl. 244—75 R 20 Claims



1. In an aircraft wing flaperon system comprising a flap, flap power means and means driven thereby to extend and retract the flap, flap guide means mounted in the wing to support and guide the flap, and an aileron segment contained within, defining a portion of and attached to the flap for rotation relative to the flap about an axis of rotation, an improved aileron segment control system comprising:

aileron segment rotation power means connected to receive pilot inputs;

a first power transfer means having an output shaft for controlling the aileron segment, said first power transfer means connected to and adapted to be supported and guided by the flap guide means in a generally translational mode along the wing, said transfer means attached to and caused to move with the flap by the means to extend and retract, and connected to both said aileron segment rotation power means and said output shaft such that said output shaft is driven responsive to pilot inputs;

a second power transfer means fixed to and movable with the flap and having an input shaft attached to receiver power from said first power transfer means and a power output means attached to the aileron segment for rotating the aileron segment about is axis of rotation; and

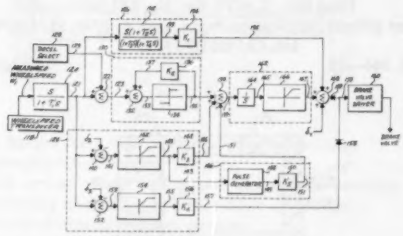
flexible drive means connecting said output shaft of said first power transfer means to said input shaft of said second power transfer means for driving said power output means of said second transfer means in rotation.

4,180,223
LIMITED-SLIP BRAKE CONTROL SYSTEM

Robert L. Amberg, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1977, Ser. No. 865,181
Int. Cl.[2] B64C 25/46
U.S. Cl. 244—111 26 Claims

18. In a limited-slip brake control system controlling brake force to be developed by a braking means for a wheel of an aircraft, the wheel being supported by a lightly-damped landing gear strut assembly, the limited-slip brake control system being operative to compare measured deceleration of the wheel with a reference deceleration to obtain a deceleration error signal, and to integrate the deceleration error signal to obtain a brake control signal representing a desired level of brake force, an improvement for compensating the brake control signal for oscillation therein resulting from low-frequency oscillation in the measured wheel deceleration that is produced by the landing gear strut assembly when brake force is developed by the wheel, the improvement comprising a dynamic compensation circuit responsive to measured wheel deceleration for providing a compensating brake control signal having

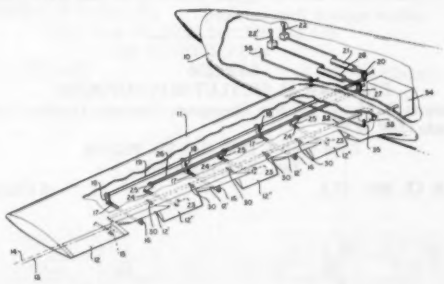


a 90° or greater phase lead for a range of frequencies in the measured wheel deceleration surrounding the expected frequency of oscillation produced by the landing gear strut assembly in the measured wheel deceleration, and a lesser phase lead for all other frequencies in the measured wheel deceleration; and, means for combining said compensating brake control signal with said brake control signal to compensate said brake control signal for said oscillation.

4,180,224
AERIAL DISPERSAL SYSTEM

Dallas M. Ryle, Jr., Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Apr. 6, 1978, Ser. No. 894,163
Int. Cl.[2] B64D 1/18
U.S. Cl. 244—136 5 Claims



1. An aerial dispersal system for the distribution of chemicals from an aircraft having a pair of fixed wings comprising:

a segmented trailing edge on at least one of said wings, the individual segments of which are hinged at and along a common line;

a nozzle mounted on and carried by said at least one wing at each of the adjacent edges of said segments, each said nozzle being located forward of said common hinge line and facing in an aft direction;

a source of dispersant;

ducting between said dispersant source and each said nozzle;

a control connected in said ducting and operable in the alternate to permit and to prevent the flow of dispersant from said source to each said nozzle; and

an actuator connected to each said segment and operable to move each alternate segment in opposite directions to generate turbulence in the air flow passing said at least one wing during flight of the aircraft at each junction of said

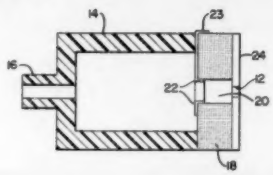
segments which turbulence sheds in the wake of said aircraft whereby dispersant when ejected by each said nozzle is entrained by the turbulence created by the associated segments.

4,180,225

INK JET RECORDING APPARATUS

Takahiro Yamada, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 5, 1977, Ser. No. 857,707
Claims priority, application Japan, Dec. 6, 1976, 51/145576
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **17 Claims**



1. A recording head assembly for ink jet recorders comprising:

a hollow member having an inlet opening for supply of pressurized ink at one end thereof;

and end plate made of an electrical insulator having at least one outlet opening and being attached to the other end of the hollow member as an end wall thereof to form an ink reservoir in cooperation with the hollow member;

at least one inner electrode disposed on the end plate around said outlet opening on the inside of the ink reservoir;

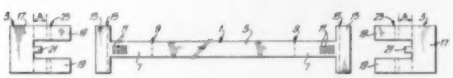
at least one outer electrode attached to the end plate on the outside of the ink reservoir and having an orifice aligned with said outlet opening, said at least one inner electrode and said at least one outer electrode being arranged for receiving an electric signal indicative of character information applied therebetween.

4,180,226

ELECTRICAL OUTLET BOX SUPPORT

Jacques R. Matte, 187 Rue Thompson, Gatineau, Quebec, Canada (J8P 6L9)

Filed May 4, 1978, Ser. No. 902,644
Int. Cl.[2] G12B *9/00*
U.S. Cl. 248—27.1 **6 Claims**



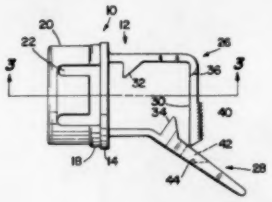
1. A support for mounting an electrical outlet box in an aperture in a building panel, said support comprising: a U-shaped yoke having a base portion, a pair of legs substantially normal to the base portion and a support foot extending outwardly from each leg substantially parallel to the base portion and adapted to overlie an area of the front of the building panel adjacent the aperture when the yoke is inserted in the aperture, each leg having an array of slots intermediate the base portion and the foot; and a clamping member for association with each leg of the yoke, each clamping member having a support surface adapted to overlie an area of the back of the building panel opposite the area of the front of the building panel to be overlaid by the foot of the associated leg, a tab member extending from said support surface and adapted to extend through a slot of the array of slots of the associated leg of the yoke and then be bent over to interconnect the clamping member to the associated leg of the yoke, and a clamping arm extending from the support surface on each side of the tab member, each arm being bendable to a first position extending out of the aperture in the building panel in a direction substantially normal to the front of the building panel and bendable to a second position when an electrical outlet box is positioned in the aperture in the building panel, over the edge of the electrical outlet box to secure the electrical outlet box in position.

4,180,227

NON-METALLIC SHEATHED CABLE CONNECTOR

Thomas J. Gretz, Stow, Ohio, assignor to The Scott & Fetzer Company, Bedford Heights, Ohio

Filed Feb. 6, 1978, Ser. No. 875,236
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—56 **8 Claims**



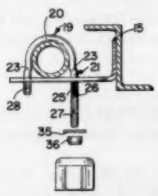
1. A one-piece plastic sheath cable connector including a bushing portion, means on the bushing portion for locking it in an aperture, an axially extending opening in the bushing portion through which a cable may be received, first and second strain relief gripping members on opposite sides of the central opening and initially extending generally axially from one end of the bushing, the first gripping member then extending transaxially substantially across a projection of the bushing member with the free end of the first gripping member being engageable in latching relationship with the second gripping member, a window in the transaxially extending portion of the first gripping member for receiving the cable, three cable-gripping teeth distributed along the axial direction, the two endmost gripping teeth being associated with one gripping member and the intermediate gripping tooth being associated with the other gripping member.

4,180,228

PIPE CLAMP

Richard C. Snyder, Michigan City, Ind., and Donald C. Bodinger, Pelham, Ala., assignors to Pullman Incorporated, Chicago, Ill.

Filed Mar. 29, 1978, Ser. No. 891,418
Int. Cl.[2] F16L *3/04*
U.S. Cl. 248—74 R **4 Claims**



1. In a railway car having an underframe and members such as pipes for carrying brake lines and the like, a clamp comprising:

a generally U-shaped bolt including a bend portion and substantially parallel first and second legs;

bracket means mounted on the underframe;

said bracket means having holes through which the legs of the U-bolt extend thereby entrapping the pipe between the bend portion and the bracket;

said first leg having a grooved portion, a recessed portion and a threaded severable end portion;

said severable end portion being severable at the recessed portion at predetermined force on the leg;

a collar for permanently fastening the U-bolt at the grooved portion of the first leg;

said second leg being initially unsecured, and adapted to receive a threaded fastener so that the collar on the first leg can be cut off and the U-bolt secured by means of said threaded fastener;

said bend portion having a substantially semi-circular flat surface in contact with the pipe thereby minimizing stress on the pipe and insuring a snug fit;

said first and second legs each being connected to the bend portion by an outwardly flared portion;

said first and second legs being spaced from and offset with respect to the outside diameter of the pipe, thereby facilitating installation and preventing damage to the threaded and grooved portions of the legs during installation of the bolt; and

the hole through which the second leg extends includes an inner peripheral surface radially spaced a predetermined distance from said second leg sufficient to permit axial positioning of the second leg therethrough and accommodating limited stress attenuating deflection of said second leg when unsecured, and said second leg being reactively engageable against said inner peripheral surface to abate excessive movement of said second leg attendant to predetermined dynamic loading on the pipe during high speed rail operations thereby preventing substantial deflection of said second leg from a generally perpendicular disposition relative to the plane of said bracket hole.

4,180,229

SUCTION-ATTACHABLE KITCHEN APPLIANCE

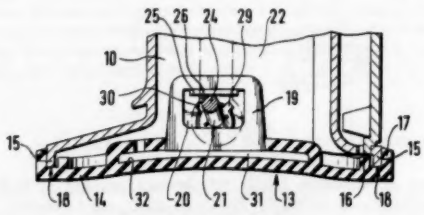
Rolf G. Schüllein, Singhofen, Fed. Rep. of Germany, assignor to Leifheit International Günter Leifheit GmbH, Nassau, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,172

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645248

Int. Cl.[2] A45D *42/14*

U.S. Cl. 248—363 **17 Claims**



1. An appliance, particularly a kitchen appliance, comprising a housing having a bottom; first means for supporting said housing on and attaching the same to a support surface, including a suction plate of an elastically yieldable material and capable of adhering to the support surface; and second means mounted in said housing for actuating said suction plate to thereby attach said housing to said support surface, said second means being displaceable between a first position in which said suction plate is in a first released condition, a second position in which said suction plate is actuated so as to attach said housing to the support surface, and a third position in which said suction plate is in a second released position and in which said second means can be readily withdrawn from said housing.

4,180,230

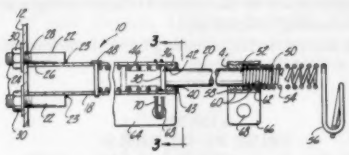
HANGER FOR VEHICLE MUD FLAPS

Nash P. Sogoian, 1417 21st St., Detroit, Mich. 48216

Filed Mar. 13, 1978, Ser. No. 885,362

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—573 **12 Claims**



1. A hanger for a vehicular mud flap comprising:

an elongated first support member,

means carried at one end of said first support member for mounting said first support member to a vehicle,

a second elongated support member,

means for telescopically mounting said second support member relative to said first support member,

resilient means for urging said second support member toward a telescopically extended position with respect to said first support member,

a lateral deflection means secured to and extending outwardly from the free end of said second support member said lateral deflection means comprising at least one resilient member adapted to be deflected laterally in a manner to urge said second support member toward a telescopically retracted position, and

means for securing a mud flap onto said support members so that said mud flap hangs downwardly from said support members.

4,180,231

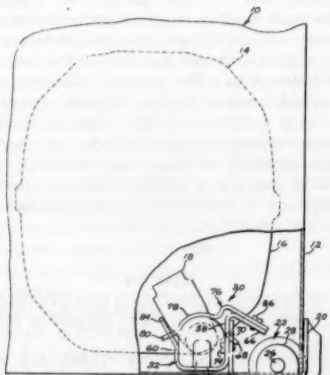
VIBRATION DAMPENING SUPPORT

Lowell C. Burnham, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 30, 1978, Ser. No. 938,166

Int. Cl.[2] F16F *15/04*

U.S. Cl. 248—632 **17 Claims**



1. A vibration dampening support for mounting a structure horizontally comprising:

(a) a stationary mounting bracket having an inside U-shape configuration as viewed in lateral cross section and an inwardly projecting lug,

(b) an elastomeric bushing having a top, sides, bottom back and front walls located in the mounting bracket with the back wall abutting the lug, said bushing including;

(i) a top and bottom section which are connected to each other at the back wall by a hinge that is perpendicular to the longitudinal axis of the bushing,

(ii) a cavity through the front wall to receive the structure for mounting,

(iii) the bottom section having an outside configuration complimentary to the inside U-shape configuration of the mounting bracket, and

(c) a strap secured to the mounting bracket and engaging the top section of the bushing.

4,180,232

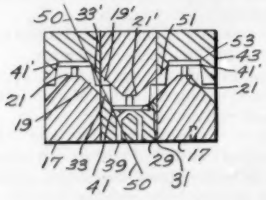
TRUSS PANEL MOLD

James S. Hardigg, Baptist Hill, Conway, Mass. 01341

Filed Jan. 13, 1977, Ser. No. 759,233

Int. Cl.[2] B28B *7/34*

U.S. Cl. 249—60 **7 Claims**



1. A mold for forming an integrated truss structure comprising:

a plurality of male mold members, each of said male mold members having a top surface, and a plurality of open grooves formed in said top surface and sloping away therefrom,

a plurality of female mold members, each of said female mold members having a recessed cavity therein, said cavity having a generally flat surface and a plurality of open grooves formed in each of said female mold members and sloping away from said surface of said cavity;

said male and female mold members being positioned opposite one another with said open grooves in said male and female mold members being aligned to define strut beam chambers and said top surfaces of said male mold members being aligned with said recessed cavities in said female mold members to define junction chambers, one of said male mold members being positioned adjacent each female mold member, and vice versa, to thereby define alternate symmetrical upper and lower junction chambers interconnected by said strut beam chambers, and

means in at least one of said mold members for permitting the injection of a moldable material into said strut beam chambers and said junction chambers.

4,180,233

BUILDING CONSTRUCTION SYSTEM

James H. Johnson, Rochester, N.Y., assignor to Housing Systems, Inc., Penfield, N.Y.

Continuation-in-part of Ser. No. 712,961, Aug. 9, 1976, abandoned, and a continuation-in-part of Ser. No. 146,904, May 26, 1971, abandoned, and Ser. No. 809,071, Mar. 21, 1969, abandoned. This application Oct. 18, 1978, Ser. No. 952,517

Int. Cl.[2] B28B *7/30*

U.S. Cl. 249—144 **11 Claims**

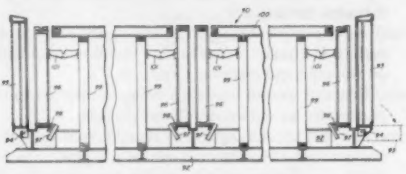
1. A building construction system comprising:

(a) a mold to receive hardenable casting material such as concrete or the like, having a base supporting an internal portion and an external portion to receive such casting material to form a building, said external portion including outside mold walls positionable to define outside faces of external building walls and said internal portion including inside form sections;

(b) means connecting said outside mold walls to said base for positioning said outside mold walls adjacent inside form sections to define external building walls, and for moving said outside mold walls into molding configuration toward said internal portion and out of molding configuration away from said inside form sections; and

(c) said internal portion comprising:

(1) inside form sections defining at least one mold section for at least one interior building partition, and



(2) inside form sections facing said outside mold walls to define exterior building walls,

(3) means for supporting said inside form sections on said base for motion relative to said base to release a casting upon lifting from said mold; and

(4) said supporting means including means for bracing said walls against inward motion from a lowermost position of said walls and means permitting inward motion of said inside form sections thereby releasing said casting material after hardening thereof as said walls are raised from said lowermost position.

4,180,234

PNEUMATICALLY OPERATED VALVE WITH A MANUALLY OPERATED BACK-UP DISPLACING MECHANISM

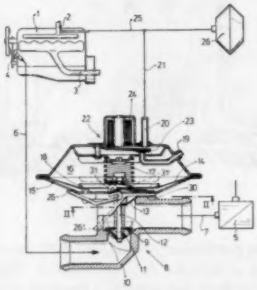
Wilhelm Hertfelder, Steinenbronn, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 828,228

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642305

Int. Cl.[2] F16K *31/42, 31/524*

U.S. Cl. 251—14 **8 Claims**



1. A device for regulating the flow of a heat-exchange medium through a circuit of an arrangement for controlling the climate inside a motor vehicle, comprising a flow-control valve interposed in the circuit and displaceable between a closed and an open position, said valve including a valve housing and a valve member within said valve housing and displaceable relative thereto between said positions, and a sealing diaphragm connected to said valve housing to delimit a control space in the latter; pneumatically operated means for displac-

ing said valve between said positions thereof, including an actuator housing and an actuating diaphragm connected to said actuator housing to delimit an actuating space in the latter and arranged with a spacing from said sealing diaphragm, and an actuating rod connected to said actuating diaphragm and to said valve member and passing through said sealing diaphragm; and an auxiliary mechanism operative for displacing said valve toward said open position thereof in the event of malfunction of said pneumatically operated means so as to permit the arrangement to control the climate even in such an event, said mechanism including a rocker-arm lever tiltably mounted on said valve housing and operatively connected to said valve member, and wherein said lever is arranged in said spacing between said diaphragm and acts on said actuating diaphragm to displace said valve member toward said open position thereof.

4,180,235

THROTTLING DEVICE FOR FLUIDS

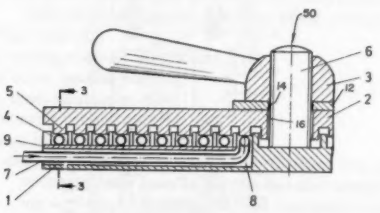
Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 3, 1978, Ser. No. 866,237

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700491

Int. Cl.[2] F16K *7/06*

U.S. Cl. 251—8 **5 Claims**



1. A throttling device for fluids, comprising a flexible tube in which the fluid is conveyed, having a compressible wall to vary the cross section thereof, a base plate having a continuous spiral channel in which said tube is accommodated, a cover plate overlying said base plate and having a projecting surface of a complementary spiral of a dimension and location such that it projects into said channel to engage and compress said tube therein, and control means for displacing said cover and said base plate relatively for selectively advancing and retracting the projecting surface and groove relatively for varying the flow cross section of said tube.

4,180,236

NORMALLY-OPEN VALVE ASSEMBLY WITH SOLENOID-OPERATED PILOT

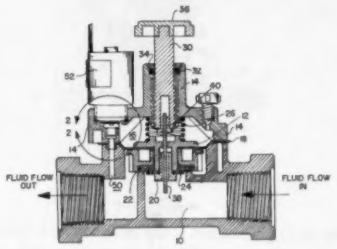
Myrl J. Saarem, Carson City, Nev., and Dale F. Soukup, Meadow Vista, Calif., assignors to Richdel, Inc., Carson City, Nev.

Filed May 24, 1976, Ser. No. 689,155

Int. Cl.[2] F16K *31/385, 31/40*

U.S. Cl. 251—30 **3 Claims**

1. A normally-open valve assembly for controlling fluid flow, said valve assembly including: a casing defining a primary valve chamber and an auxiliary valve chamber communicating with said primary valve chamber, said auxiliary valve chamber having a discharge port providing an outlet from said auxiliary valve chamber, and at least one of the auxiliary and primary valve chambers having a bleed port providing an inlet into said valve chambers; a valve actuator movable in said primary valve chamber between a first position in which the valve is open and a second position in which the valve is closed; a manually operated handle threaded into said casing in position to engage said valve actuator to move said valve actuator towards its second position to limit the movement of the valve actuator; a valve seat included in said discharge port; a normally-open solenoid-operated valve positioned in said auxiliary valve chamber and having a plunger extending into said discharge port beyond said seat; a member attached to the distal end of the plunger having a diameter greater than the diameter of said plunger; a spring normally biasing said plunger to an open position in said discharge port in which said member attached to the distal end of the plunger is displaced



from said seat so as to permit the discharge of fluid from the auxiliary valve chamber and from the primary valve chamber when the solenoid is de-energized so that there is insufficient pressure exerted on the valve actuator to hold the valve actuator at its second position whereby said valve actuator is established at its first position, said solenoid-operated valve drawing said member at the distal end of said plunger against said seat to close said discharge port when the solenoid is energized to block the flow of fluid through said discharge port so as to cause a build-up of pressure in said primary valve chamber causing said valve actuator to move to its second position.

4,180,237

HYDRAULIC VALVE SYSTEM

Clyde C. Wolf, 4100 E. 60th Ave., Commerce City, Colo. 80022

Filed Jun. 6, 1977, Ser. No. 803,621

Int. Cl.[2] F16K *31/143, 31/122*

U.S. Cl. 251—57 **1 Claim**

1. A remote control for an hydraulic fluid flow valve for a pressurized vessel fluid outlet comprising:

(a) master hydraulic cylinder means arranged to be mounted in a general vertical condition for operation and having a fluid outlet at one end and a closure at the opposite end and a small bore intermediate thereof;

(b) free piston means reciprocably mounted in said cylinder, said free piston being elongated and including an O-ring seal adjacent each end for sealing hydraulic fluid between said free piston and said fluid outlet;

(c) plunger means reciprocably mounted through said closure in contact with said free piston;

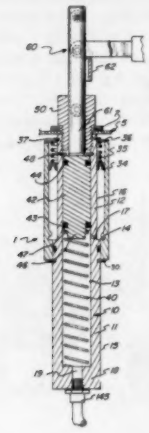
(d) pivoted lever means arranged to depress and release said plunger means;

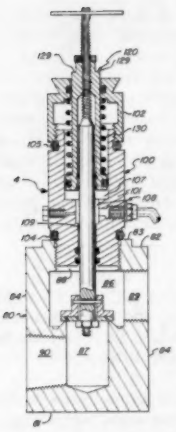
(e) coil spring means in said cylinder means biasing said free piston means toward said closure;

(f) annular, concentric, tubular reservoir means around said cylinder means, said annular reservoir extending only substantially midway along the length of said cylinder and being sealed to said cylinder by means of an O-ring; and a small passageway providing communication between said reservoir means and said cylinder means, whereby said spring normally biases said piston means adjacent said closure means opening said reservoir to said cylinder means and depression of said plunger forces hydraulic fluid to the hydraulic fluid flow valve for opening the same;

(g) an annular seal mounted in said annular reservoir in the

end opposite said small passageway, and coil spring means biasing said annular seal toward said small passageway,





and means in said annular reservoir for preventing movement of said annular seal over said small passageway.

4,180,238

VALVE ACTUATOR HAVING A ROTARY BI-DIRECTIONAL APPARATUS WITH A DUAL RATCHET MECHANISM

John D. Muchow, Long Beach, Calif., assignor to Valve Concepts International, Inc., Torrance, Calif.

Filed Aug. 22, 1978, Ser. No. 935,767

Int. Cl.[2] F16K *31/52, 31/16*

U.S. Cl. 251—58 **5 Claims**

1. A bi-directional valve actuator with a ratchet mechanism for use in combination with a control valve which includes a stem which, when turned, adjusts the flow through the control valve, said bi-directional valve actuator comprising:

a. a frame which is mechanically coupled to the control valve adjacent to the outer end of the stem thereof;

b. a shaft disposed within said frame and rotatably coupled thereto, said shaft is mechanically coupled to the stem of the control valve so that it can turn the stem thereof;

c. a first ratchet wheel which is coaxially aligned with said shaft and which is fixedly coupled thereto;

d. a second ratchet wheel which is coaxially aligned with said shaft and which is fixedly coupled thereto;

e. a first pawl having a first end and a second end;

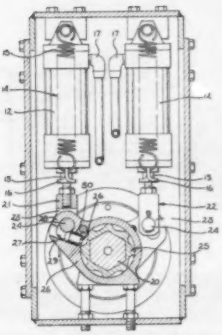
f. coupling means for coupling said first end of said first pawl to said first ratchet wheel during a forward stroke of said first pawl and for uncoupling said first end of said first pawl from said first ratchet wheel during a backward stroke of said first pawl;

g. a first hydraulic cylinder which is mechanically coupled to said frame and which has a piston which is mechanically coupled to said second end of said first pawl in order to drive it forward;

h. a first elongated member with two arms which is mechanically coupled to said piston of said first hydraulic cylinder adjacent to said first pawl and which is disposed orthogonally to said piston and aligned coaxially therewith;

i. a first pair of springs which are disposed parallelly to said first hydraulic cylinder and each of which is mechanically coupled to said frame and to one of said two arms of said first elongated member whereby said piston of said first hydraulic cylinder and said first pair of springs interact to provide a reciprocal and incremental force on said first pawl in order to drive said first pawl;

j. a second pawl having a first end and a second end;



k. coupling means for coupling said first end of said second pawl to said second ratchet wheel during a forward stroke of said second pawl and for uncoupling said first end of said second pawl from said second ratchet wheel during a backward stroke of said second pawl;

l. a second hydraulic cylinder which is mechanically coupled to said frame and which has a piston which is mechanically coupled to said second end of said second pawl in order to drive it forward;

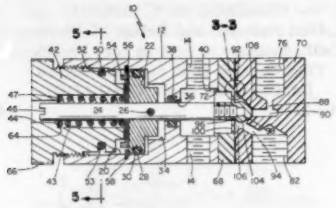
m. a second elongated member with two arms which is mechanically coupled to said piston of said second hydraulic cylinder adjacent to said second pawl and which is disposed orthogonally to said piston and aligned coaxially therewith; and

n. a second pair of springs which are disposed parallelly to said second hydraulic cylinder and each of which is mechanically coupled to said frame and to one of said two arms of said second elongated member whereby said piston of said second hydraulic cylinder and said second pair of springs interact to provide a reciprocal and incremental force on said second pawl in order to drive said second pawl.

4,180,239
METERING VALVES

Robert W. Valukis, Sherborn, Mass., assignor to Electron Fusion Devices Inc., East Providence, R.I.

Continuation of Ser. No. 805,799, Jun. 13, 1977, abandoned.
This application Nov. 6, 1978, Ser. No. 958,137
Int. Cl.[2] F16K *31/122, 1/52*
U.S. Cl. 251—60 2 Claims

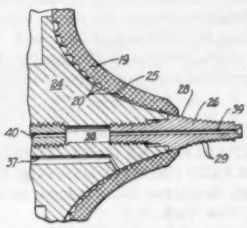


1. A metering valve comprising
a fluid passage member,
said fluid passage member comprising
a fluid inlet passage,
a conical valve seat portion, and
a fluid outlet passage,
said conical valve seat portion being intermediate said fluid inlet passage and said fluid outlet passage,
a valving element,
said valving element comprising
an outer annular portion,
an inner annular portion,
a conical valving surface, and
drive rod connection means,
said inner annular portion being integral and coaxial with said outer annular portion and said conical valving surface and flexible to permit movement axially of said conical valving surface longitudinally into and out of engagement with said conical valve seat portion,
a piston,
a drive rod,
a valve body,
said valve body comprising
an abutment surface for abutting said valving element around said outer annular portion,
a relieved portion adapted to sealingly permit longitudinal reciprocation therein of said drive rod,
an inner cylindrical surface to sealingly permit longitudinal reciprocating of said piston, and
a screw-threaded portion at its end longitudinally spaced from said abutment surface,
a plug screw-threadedly engaging said screw-threaded portion,
said drive rod being secured at one end in said drive rod connection means and being secured intermediately to said piston for reciprocation therewith,
biasing means engaging said plug to bias said drive rod toward said valve body, and
a vibration element comprising a frictional element engaging said plug around an outer diameter thereof and said valve body at discontinuous spaced locations around an inner diameter thereof,
said fluid passage member, valving element, and valve body being secured in longitudinal and abutting relationship,
whereby said plug may be adjusted like a micrometer to provide delicately controlled valving surface stroke within a small range permitted by the flexibility of said inner annular portion of said valving element.

4,180,240
LOW NOISE LEVEL CONTROL VALVE

Robert S. Sheldon, and Jan W. Rabek, both of Northridge, Calif., assignors to Air-Dry Corporation of America, Northridge, Calif.

Filed Dec. 16, 1977, Ser. No. 861,266
Int. Cl.[2] F16K *47/02, 25/00*
U.S. Cl. 251—127 20 Claims

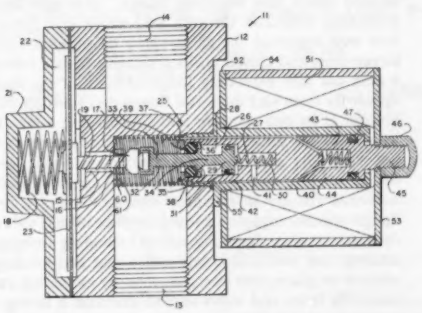


1. A low noise level control valve comprising (i) an inlet and (ii) an outlet, (iii) a poppet mounted for movement on a given line with respect to a valve seat between open and closed positions to control the flow of fluid from said inlet to said outlet, (iv) means defining a plurality of spaced orifices disposed between the periphery of said poppet and said valve seat, said orifices being constructed and arranged so that they are of progressively increasing diameter and progressively more transverse to the direction of movement of said poppet in relation to their distance away from said inlet, and (v) a balancing chamber disposed on the opposite side of said poppet from said inlet, a passage extending through said poppet to connect said balancing chamber to a point adjacent to approximately the mid-portion of said means defining said orifices to provide pressure in said chamber to counter-balance the opening movement of said poppet.

4,180,241
SOLENOID OPERATED VALVE AND SHUT-OFF DEVICE

Frank Fiedler, Jr., 2429 Agostino Dr., Rowland Heights, Calif. 91748

Filed May 31, 1978, Ser. No. 911,274
Int. Cl.[2] F16K *31/02*
U.S. Cl. 251—130 9 Claims



1. A combined solenoid operated valve and shut-off device comprising:
a valve housing means defining a fluid inlet, a fluid outlet and a valve seat therebetween;
a valve closure means movable between a closed position against said valve seat and an open position away therefrom, said closure means preventing fluid flow between

said inlet and outlet when in said closed position and permitting said fluid flow when in said open position;

a valve operator means coupled to said valve closure means and operative to produce movement thereof between said open and closed positions, said valve operator means comprising electromagnetic means for cycling said valve closure means between said open and closed positions in response to an electrical signal input, and said valve operator means further comprising shut-off means activatable to move said valve closure means to said closed position and to lock said closure means therein in response to a predetermined fluid pressure at said inlet; and

manual reset means for returning said valve closure means to said open position after activation of said shut-off means.

4,180,242

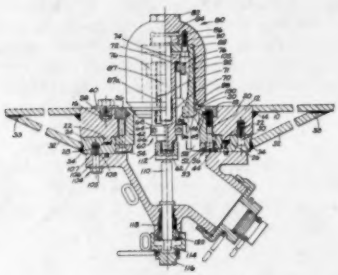
BOTTOM OPERABLE TANK CAR LADING VALVE WITH MINIMUM SKID PROTECTION FOR RETROFIT

Charles E. Reedy, Bridgeton, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 834,655, Sep. 19, 1977. This application Nov. 8, 1978, Ser. No. 958,867

Int. Cl.[2] F16K *35/00*

U.S. Cl. 251—144 **4 Claims**



1. A separately removable skid and valve seat for a bottom operable tank lading valve assembly comprising:

a generally cylindrical universal flange welded to the tank bottom; a lading valve seat located radially within said universal flange; said valve seat being cylindrical including an opening for lading flow and a seat for a valve closure; said lading valve seat having a valve seat flange located below said universal flange; valve seat fasteners extending vertically through said valve seat flange and into said universal flange; a valve closure movable between open and closed position relative to said valve seat; a tank car skid extending longitudinally of the tank and upwardly from said universal flange and abutting the tank bottom at its end portion; said skid having a skid flange located below said universal flange; skid fasteners extending vertically into said skid flange and said universal flange holding said skid flange in engagement with said universal flange; an operator retainer having a retainer flange portion engaging a lower surface of said valve seat; operator retainer fastening means extending through said retainer and into said lading valve seat and holding said retainer in place; said operator retainer extending radially inwardly from said valve seat to maintain a lading valve operator spaced from the walls of said lading valve seat and vertically fixed; an outlet chamber including an opening for lading flow and at least one unloading spout extending below said skid flange and said retainer flange and attached to said skid flange with outlet chamber fasteners extending into said skid flange defining a shear plane, whereby said outlet chamber can be removed by removing said outlet chamber fasteners; said skid can be removed separately from said valve seat by removing said skid fasteners, and whereby said retainer and said valve operator can be removed separately from said skid by removal of said retainer fasteners, and whereby said retainer and said valve operator can be removed separately from said lading valve closure and lading valve seat with lading in the tank.

4,180,243

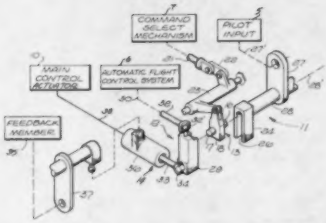
AUTOMATIC AND MANUAL LINEAR REVERSION CONTROL MECHANISM

William W. Hsu, Burbank, and Robert McPherson, Valencia, both of Calif., assignors to Textron Inc., Providence, R.I.

Filed Oct. 14, 1976, Ser. No. 732,266

Int. Cl.[2] F16K *31/44;* **G05G** *11/00*

U.S. Cl. 251—234 **5 Claims**



1. A mechanism for linearly transferring the control over an apparatus connected to said mechanism between manual control and automatic control comprising:

manual input means for providing a manual input signal, to said mechanism;

automatic input means for providing an automatic input signal to said mechanism;

selector means having first and second limit positions including pin means slidably connected to both said manual input means and said automatic input means via linear transfer coupling means; and

means for shifting said pin means between said first and second limit positions to provide linear transfer of control over said apparatus from being totally controlled by said manual input means when said selector means is in said first limit position and totally controlled by said automatic input means when said selector means is in said second limit position and controlled partially by each of said manual and automatic input means when said selector means is in any position other than said limit positions.

4,180,244

STOPCOCK FORMED OF SHEET METAL

Johann Rosenitsch, Vienna, Austria, assignor to Hübner-Vamag Aktiengesellschaft & Co. Kommanditgesellschaft, Vienna, Austria

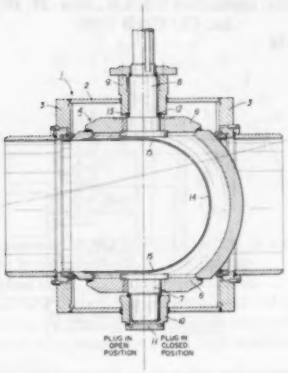
Filed May 23, 1977, Ser. No. 799,403

Int. Cl.[2] F16K *5/06*

U.S. Cl. 251—309 **7 Claims**

1. Stopcock comprising a welded housing and a ball-shaped plug, said plug including two ball-shaped half shells each pressed from a sheet metal blank, wherein the improvement comprises that said housing includes a sheet metal blank formed into a unitary tubular shell having a pair of opposite open ends with the axis of said tubular shell extending through the open ends, a planar annular ring disk positioned at each open end of said tubular shell with each said ring disk cut from a sheet metal blank and welded around the radially outer circumferential periphery thereof to the open end of said housing at which it is positioned so that each said ring disk forms an opening into the tubular shell for providing a flow of fluid therethrough, said plug having a pair of first apertures formed therethrough, with said first apertures aligned opposite one another and disposed approximately perpendicularly to the

axis of said tubular housing, an annular disk-shaped core welded into each of said first apertures, said plug including a drive shaft and a bearing journal in axial alignment with one another and each extending radially outwardly from an opposite side of said plug and each extending through a different one of said disk-shaped cores, said housing having a pair of second apertures aligned opposite one another on opposite sides of said tubular shell and aligned with said first apertures in said plug said ball-shaped half shells having a pair of first openings alignable with the open ends of said housing, an axially extending tubularly shaped first plate having a first pair



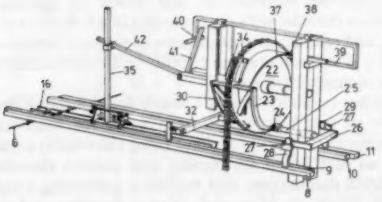
and a second pair of oppositely disposed axially aligned openings is located within said ball-shaped half shells with the first pair of openings aligned with the pair of first openings formed by said half shells with said tubularly shaped first plate forming a passage for affording flow through said plug between said first pair of openings, the second pair of openings in said first plate being aligned with the first apertures formed by said half shells and providing access for insertion of said shaft and said journal into said bearings during assembly of the stopcock, and a pair of second plates each insertable into a different one of the second pair of openings in said first plate for effecting a tight closure of the second openings.

4,180,245

MECHANICAL FENCING MACHINE

Colin C. Anderson, 6 Montrose Pl., Beaumont, Australia (5066)

Filed Apr. 18, 1978, Ser. No. 897,258
Claims priority, application Australia, Apr. 19, 1977, PC9798
Int. Cl.[2] B66F *3/00*
U.S. Cl. 254—64 **9 Claims**



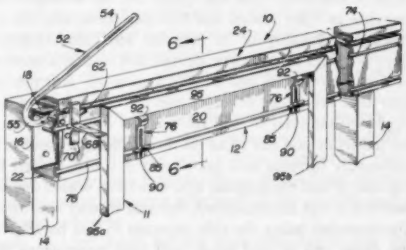
1. A fencing machine for producing a fence along a fence line, said machine being adapted to be moved along the fence line and including means for feeding at least a plurality of wires from reels of wire, said free ends of the wires being attached to anchor means at the begining of the fence line, means for tension said wires, means for presenting posts having offset slots to the wires, and means for deflecting the tensioned wires to enable the wires to enter into and be locked into the slots.

4,180,246

APPARATUS FOR STRETCHING CANVAS AND LIKE MATERIALS

Richard Guy, 27752 Torija, Mission Viejo, Calif. 92691

Filed Oct. 30, 1978, Ser. No. 956,076
Int. Cl.[2] B66F *19/00*
U.S. Cl. 254—77 **10 Claims**



1. An apparatus for stretching and mounting canvas and like materials to a frame structure, wherein the apparatus comprises:

an elongated structural-beam member adapted to be horizontally mounted to a support structure;

a clamping-bar member hingedly connected to said beam member throughout the length thereof;

keeper means disposed between said clamping bar and said beam member to releasably secure a free edge of said canvas therein;

a lever-actuating means positioned adjacent one end of said apparatus to control the opening and closing of said clamping bar;

spring-biasing means disposed between said clamping bar and said beam member, whereby a biasing force is equally applied throughout the length of said clamping bar;

hinge means interconnecting said clamping bar and said beam member whereby said clamping bar is movable relative to said beam member; and

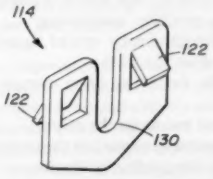
frame-positioning means adjustably mounted to said beam member wherein said frame structure is positioned and supported on said apparatus so as to allow said canvas to be secured thereto in a tightly stretched manner.

4,180,247

CHAIN LINK FABRIC ATTACHING SYSTEM

Walter L. Pfarr, Jr., Towson, Md., assignor to Anchor Post Products, Inc., Baltimore, Md.

Filed May 20, 1977, Ser. No. 798,749
Int. Cl.[2] E044 *17/02*; B21F *27/00*
U.S. Cl. 256—54 **3 Claims**



1. A holding system for attaching chain link fabric to a framework structure, comprising:

a plurality of flexible formed clips, each said clip consisting of two arms with a portion of each arm being parallel to one another and permanently linked together at the adjacent end by a continuation of one arm to become the other opposite arm, said arms continuing from the point where permanently linked to each other to their respective distal ends, a protrusion is extending from one surface of each of

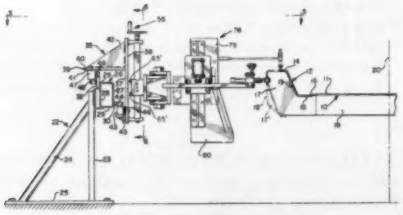
said two arms, said flexible formed clips attaching said chain link fabric to said framework structure by looping each said flexible formed clip over a wire member of said chain link fabric and inserting said two arms of said flexible formed clip into one or more apertures in said frame work structure and so that said protrusions lock on opposite sides of said aperture, said two arms being formed from a relatively thin flat plate and so arranged as to provide an open central slot between them, said flat plate having a plurality of rectangular apertures therein on opposite sides of said open central slot so that a portion of said apertures is in one of said two arms, and the other apertures are in the other of said two arms, and wherein displaced material of said rectangular aperture is disconnected from said flat plate on three sides only and is bent outwardly forming said protrusion at a slight angle from the side of said rectangular aperture from which displaced material is not disconnected, the side of said aperture not disconnected being the side adjacent to and parallel with the distal end of said arms, said bent protrusions being deformed so that a portion of said protrusions extend from both sides of said flat plate, a portion of said protrusions being in each of said two arms.

4,180,248

FLAME CUTTING MACHINE FOR MODIFICATION OF RAILWAY CAR SIDE SILLS

John M. Benko, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,428
Int. Cl.[2] B23K 7/02
U.S. Cl. 266—67 **11 Claims**



1. A flame cutting machine positionable adjacent a railway track for trimming laterally extending plate members on the longitudinally extending side sills of a railway vehicle which support the plate members, comprising:

a plurality of longitudinally spaced support members positionable adjacent the track;

a longitudinally extending beam carried by said support members;

carriage support means on the beam;

a carriage supportably carried on the carriage support means and movable longitudinally thereon;

said carriage including adjustment means and a frame support member on the adjustment means;

a cutting torch frame supported on the frame support member;

cutting torch means on the frame;

means guiding said cutting torch means on said frame for flame cutting portions from said plate members; and

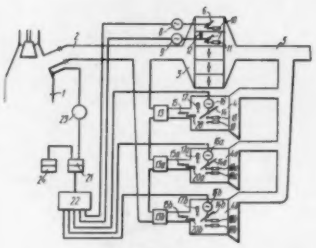
said adjustment means being adapted for selectively vertically positioning said cutting torch frame relative to the side sills of the car.

4,180,249

INSTALLATION FOR CONTROLLING PRESSURE OF GAS UNDER SHAFT TOP IN SUPER-CAPACITY BLAST FURNACE

Miriam A. Agranovskaya, Koptevskaya ulitsa, 30, kv. 24, Moscow; Vladimir A. Babich, ulitsa Stachek, 25, kv. 33, Sverdlovsk; Felix A. Ratner, Zanevsky prospekt, 28, kv. 30, Leningrad; Alexandr S. Rozenoer, ulitsa Chekhova, 3, kv. 39, Leningrad, and Moisei I. Ryvkin, prospekt Kosmonavtov, 19, korpus 1, kv. 163, Leningrad, all of U.S.S.R.

Continuation of Ser. No. 668,591, Mar. 19, 1976, abandoned.
This application Jul. 14, 1978, Ser. No. 924,730
Claims priority, application U.S.S.R., Mar. 27, 1975, 2113551
Int. Cl.[2] C21B 7/00
U.S. Cl. 266—78 **9 Claims**



1. An installation for controlling the gas pressure under the shaft top of a super-capacity blast furnace comprising:

a throttle assembly built in an outlet gas pipe of said blast furnace having at least two control throttles arranged in parallel with respect to the gas flow and having separate drives for turning said control throttles;

at least two utility gas turbines connected to said outlet gas pipe of said blast furnace in parallel to each other and to said throttle assembly, each of said gas turbines having a control diaphragm and a stop diaphragm with separate drives for turning said diaphragms; a blast furnace gas heater mounted before each of said gas turbines for preheating the blast furnace gas fed to said gas turbines to a predetermined value;

first switches mounted on said drives for turning each control throttle of said throttle assembly and being actuatable upon closure of said control throttles;

second switches mounted on said drives for turning said control diaphragms of said gas turbines and being actuatable upon closure of said control diaphragms to a predetermined extent corresponding to a minimum flow rate of blast furnace gas through said gas turbine at which the gas preheating in said preheater is not cut off automatically;

third switches mounted on said drives for turning each control throttle, with the exception of a first control throttle, and each control diaphragm of said gas turbines operating when said control throttles and control diaphragms are completely open;

a pressure regulator having a sensor for measuring the pressure of said blast furnace gas under the shaft top and having a setter, said regulator being electrically connected to all said drives for turning said control throttles and control diaphragms, said regulator generating a signal to said drives to open said control throttles and control diaphragms when said blast furnace gas pressure under the shaft top exceeds a predetermined value, said regulator generating a signal to said drives to close said control throttles and control diaphragms when the pressure under the shaft top drops down below a specified limit; and

an electrical control device which includes all contacts of said first, second and third switches and which transmits said signals from said pressure regulator to said separate drives for moving said control throttles and control dia-

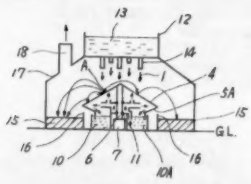
phragms in a specified order, said pressure regulator acting on only one separate drive at any instant of time.

4,180,250

APPARATUS FOR GRANULATION OF MOLTEN SLAGS

Nobuhisa Ujiie, Tokyo, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Aug. 9, 1978, Ser. No. 932,163
Claims priority, application Japan, Aug. 16, 1977, 52-98505
Int. Cl.[2] F27D *15/02*
U.S. Cl. 266—137 **5 Claims**



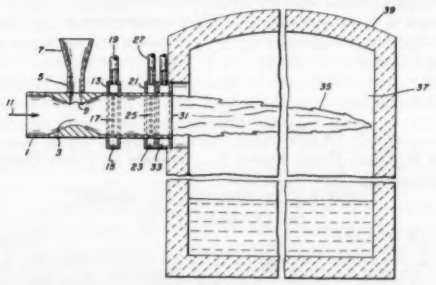
1. An apparatus for the self granulation of molten slags by a non-wetting bounce technique, comprising:
   (a) a conical target having a vertical axis,
   (b) the surface of said target being made of a hard material finished to a high degree of smoothness and having a high degree of heat resistance and a high coefficient of thermal conductivity,
   (c) a tundish bath containing molten slags disposed above said target, and
   (d) a plurality of outlet nozzles mounted in openings in the bottom of said bath for gravationally forming an equal plurality of individual discharge jets of molten slag,
   (e) said nozzles having vertical axes parallel to the axis of said conical target and being oriented to direct the slag jets onto the conical target surface at circumferentially spaced positions therearound.

4,180,251

APPARATUS FOR RECOVERING LEAD FROM BATTERY MUD

Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Division of Ser. No. 781,112, Mar. 25, 1977, Pat. No. 4,102,676.
This application Apr. 24, 1978, Ser. No. 899,551
Int. Cl.[2] C22B *13/02*
U.S. Cl. 266—172 **1 Claim**



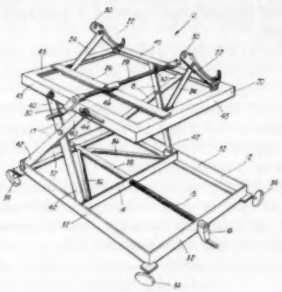
1. A burner for the direct reduction of finely divided dried battery mud comprising:
   a straight conduit through which air is introduced, said conduit having a venturi in an intermediate portion thereof;
   a feed tube through which the finely divided dried battery mud is fed, said feed tube communicating with the said conduit at the veni contracta of said venturi;
   a gaseous fuel manifold having an annular chamber therein surrounding said conduit downstream of the venturi, said conduit having a plurality of apertures angularly distributed around the wall thereof which communicate with the annular chamber of the fuel manifold and through which gaseous fuel from the fuel manifold is introduced into said conduit to create a fuel rich mixture; and
   an oxygen manifold having an annular chamber surrounding the conduit downstream of the fuel manifold, said conduit having a plurality of second apertures angularly distributed about the wall thereof which communicate with the conduit and through which oxygen is introduced into the conduit, to produce a layer adjacent the inner wall of the conduit which burns with a high propagation rate and a high temperature that provides a stable flame envelope for maintaining reducing reactions in the central part of the flame, whereby
   finely divided dried battery mud introduced into the feed tube is entrained in the air in the conduit and is reduced by the flame produced by the reducing gas and the oxygen.

4,180,252

VEHICLE DOOR AND BUMPER LIFT

James D. Cushenbery, 207 S. Buckner, Derby, Kans. 67037

Filed Dec. 22, 1978, Ser. No. 972,235
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 269—17 **7 Claims**



1. A vehicle door and bumper lift, the lift comprising:
   a wheel mounted lower frame;
   a lower cross arm slidably mounted on said lower frame;
   a first pair of pinned scissor arms, said arms crossed and pivotally pinned together intermediate an upper end portion and a lower end portion of said arms, one lower end portion of said arms pivotally pinned to said lower frame, the other lower end portion of said arms attached to said lower cross arm;
   an upper frame disposed above said lower frame and parallel thereto, said upper frame pivotally pinned to one upper end portion of said arms and slidably attached to the other upper end portion of said arms;
   means for raising and lowering said scissor arms attached to said lower frame and threadably attached to said lower cross arm;
   a J-shaped hook having an upper end portion and a lower end portion, the lower end portion of said J-shaped hook pivotally pinned to said upper frame;
   a hook arm having one end pivotally pinned to the upper end portion of said hook;
   an upper cross arm slidably mounted on said upper frame, said cross arm attached to the other end of said hook arm; and
   means for raising and lowering said hook arm attached to

said upper frame and threadably attached to said upper cross arm.

4,180,253

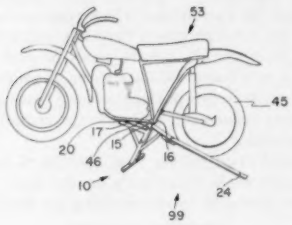
SUPPORT FOR A MOTORCYCLE

Michael S. Ivers, and Rory B. Ivers, both of 911 Los Molinos Way, Sacramento, Calif. 95825

Filed May 5, 1978, Ser. No. 902,926

Int. Cl.[2] B66F *3/00*

U.S. Cl. 269—296 **18 Claims**



1. A motorcycle support device adapted to embrace the frame structure of a motorcycle when supported on a supporting surface comprising;

an elongated main support rod adapted to rest on a supporting surface;

a second support rod spaced from said main support rod extending generally parallel thereto;

a pair of side bars interconnecting said main support rod and said second support rod forming a generally rectangular framework;

said side bars extending upwardly past said second support rod, and, each terminating in an upwardly extending U-shaped bracket;

at least one first support bar extending in a direction generally normal to the plane of said framework, said at least one first support bar having means thereon for embracing the frame of a motorcycle; and

an elongated handle member extending in a direction opposite that of said at least one support bar and outwardly from one of said side bars to a point spaced from and rearwardly of said main support rod.

4,180,254

SURGICAL APPARATUS

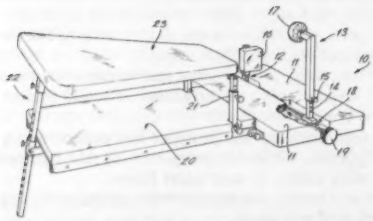
Alan J. C. Lee, Exeter, and Robin S. M. Ling, Teignmouth, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 3, 1978, Ser. No. 893,603

Claims priority, application United Kingdom, Apr. 1, 1977, 13867/77

Int. Cl.[2] A61G *13/00*

U.S. Cl. 269—328 **8 Claims**



1. Surgical apparatus for locating a patient lying on his side comprising a first platform part to support the lower hip of the patient, two first posts upstanding from respectively opposite sides of said first platform part to engage about the rear and front of his pelvis, a second platform part extending from the first such part to support the lower leg of the patient, at least one second post upstanding from said second platform part, and a third platform part connected to said second post in superposed disposition above said second platform part to support the upper leg of the patient.

4,180,255

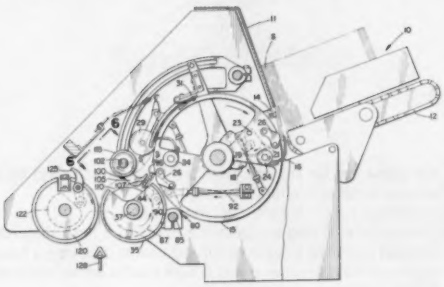
WIPER SYSTEM INSERTER

Ronald G. Himmel, Parma, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 27, 1977, Ser. No. 864,325

Int. Cl.[2] B65H *39/10*

U.S. Cl. 270—54 **6 Claims**



1. A sheet material handling device comprising a rotatable extractor drum for gripping and carrying a signature from a stack of signatures in a first signature path about the periphery of said extractor drum, stop means for providing a stop position for the signature moved by said extractor drum, a rotatable transfer drum for moving the signature from said stop position through a second signature path, the signature having a lower edge which extends toward said transfer drum when the signature is disposed in the stop position, gripper means rotatable with said transfer drum for gripping the lower edge of the signature as the transfer drum is rotated and when the signature is in said stop position, a dipper, dipper mounting means for supporting said dipper for oscillation toward and away from the lower edge of the signature, a wiper vane, said wiper vane and dipper having respective surfaces engageable with opposite surface portions of the lower edge of the signature to position the lower edge of the signature in a position to be gripped by said gripper means, and means for rotating said wiper vane in a path adjacent said dipper to a location spaced away from said second signature path to locate said wiper vane out of engagement with the signature as the signature is moved through at least part of said second signature path and back into a location to engage a surface portion of another signature being handled.

4,180,256

HIGH SPEED BAG FOLDING MACHINE

John B. Coast, Baton Rouge, La., assignor to Union Carbide Corporation, New York, N.Y.

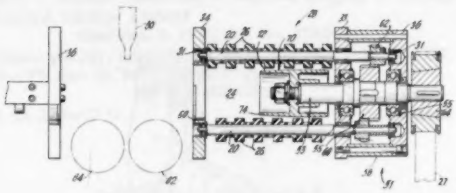
Filed Jun. 28, 1978, Ser. No. 920,051

Int. Cl.[2] B65H *45/18*

U.S. Cl. 270—83 **7 Claims**

1. In a machine for producing folded flexible sheet material, such as plastic bags, having rolling means for rolling the material into a roll and means for removing the rolled material from said rolling means in a flattened condition, wherein said rolling means comprises; a rolling section arranged in an arc circumscribing at least 270° of a circle for forming a cul-de-sac having a moving curved surface through at least a substantial portion of said 270° and an entrance opening into which said material is fed, with said rolling section being divided into at least two

laterally disposed sub-sections of substantially equal width spaced apart along a common longitudinal axis so as to provide a predetermined unobstructed opening therebetween and means for driving each sub-section; at a common speed sufficient to cause said material to wind about said moving curved surface into said roll, the improvement which comprises: a rotatable mandrel extending a predetermined distance within



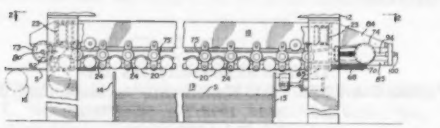
the cul-de-sac of each sub-section and having a periphery of predetermined geometry which maintains a minimum narrow free space between each mandrel and the moving curved surface of each sub-section; and means for rotating each mandrel at a peripheral speed about equal to the peripheral speed of said moving curved surface such that the rolling material is confined to said narrow free space.

4,180,257

MAGNETIC SHEET CONVEYOR

Dario Buccicone, Crown Point, Ind., assignor to Bucciconi Engineering Co., Gary, Ind.

Filed Jan. 30, 1978, Ser. No. 873,372
Int. Cl.[2] B65H *29/30*
U.S. Cl. 271—193 **9 Claims**



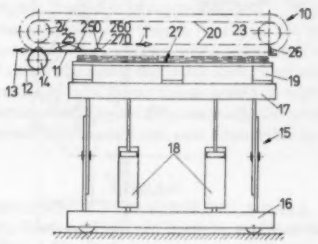
1. Conveying apparatus for magnetizable sheet material which comprises an elongate supporting frame member having mounted thereon magnetic roll units, each of which includes a coil having a core extending transversely of the frame member and secured between a pair of pole pieces in the form of plate members of substantial thickness which are disposed in fixed relation in generally parallel vertical planes on opposite ends of said core, said pole pieces being arranged so as to provide corresponding bottom edge surfaces of substantial dimension extending in a direction normal to the axis of the core, said bottom edge surfaces defining a relatively wide magnetic flux path extending between the pair thereof and transversely of said frame member, short shaft forming members of magnetizable material secured on outboard faces of said pole pieces with their axes extending transversely of said frame and roll members of magnetizable material rotatably mounted on said shaft members, adjacent the outboard faces of said pole pieces, means for driving said roll members, said roll members having peripheral surfaces of substantial width rotating in a vertical plane so that a sheet is drawn into engagement with them and advanced in a predetermined generally horizontal path which is spaced only a short distance below the pole piece bottom surfaces and in said wide magnetic flux path.

4,180,258

APPARATUS FOR TRANSPORTING AND DEPOSITING PANELS

Emil Wildförster, Weilheim, Fed. Rep. of Germany, assignor to Zarges Leichtbau GmbH, Weilheim, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,037
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2720030
Int. Cl.[2] B65H *29/32*
U.S. Cl. 271—196 **11 Claims**



1. An apparatus for transporting and depositing panels with smooth surfaces, comprising a conveyor having substantially horizontally oriented endless belt means, said belt means being guided over horizontal reversing rollers, a plurality of suction holding means carried by said belt means, each of said suction holding means having a body attached to said belt means and being provided with a suction cup being arranged at the free end of said body, some adjacent suction holding means being pressed against one of said surfaces of one of said panels to adhere firmly by suction thereto in the picking up of said panel, each of said suction holding means being further provided with a venting valve which is opened for depositing said panel at a depositing position, each of said suction cups being displaceable parallel with the transport direction in relation to the zone of attachment of its body to said belt means, and stop means being provided at said depositing position in the transport path of said panels, which stop means on arrival of one of said panels displaces all those adjacent suction cups holding said panel contrarily to said transport direction, which displacement opens the venting valves of all those adjacent individual suction holding means holding said panel.

4,180,259

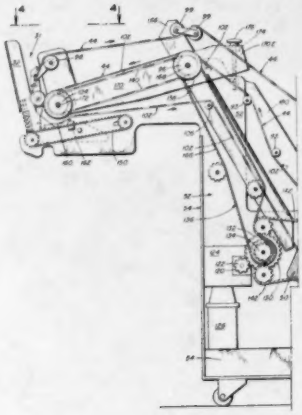
VARYING THE DROP OF SHEETS INTO A HOPPER

Elmer Bewersdorf, Downers Grove; James F. Cosgrove, Western Springs; Thomas R. Flavin, Mokena; Edward Gallagher, Oak Lawn; Willam B. Mc Cain, Hinsdale; Ronald W. Weller, Oak Lawn, and Lawrence J. Werstler, Evergreen Park, all of Ill., assignors to McCain Manufacturing Co., Chicago, Ill.

Division of Ser. No. 771,657, Feb. 24, 1977. This application Mar. 21, 1978, Ser. No. 888,776
Int. Cl.[2] B65H *29/14*
U.S. Cl. 271—200 **2 Claims**

1. In a machine where signatures or like sheets stacked at a supply station are fed therefrom sequentially in overla ped relation to a receiving hopper: transfer means for transfe ring the overlapped signatures in a stream to said hopper and including, an upper pair of feed belts located above the hopper, an upright fixed support, an elongated substantially horizontally extending cantilever frame defined by a pair of arms extending forwardly from said support, said arms supporting a lower pair of feed belts opposed to the upper pair of feed belts to clamp between them the signatures for a forward run toward said hopper, said upper and lower feed belts terminating in a delivery bite at the front end of the frame from which the signatures are fed to drop edgewise into said hopper, a shaft supported by said support and in turn pivotally supporting said frame intermediate the ends thereof on said upright support for

up and down positional movement of said bite relative to said shaft, said shaft also supporting rollers for said lower pair of feed belts, and means including an adjustment screw carried by



said frame and coacting with a fixed nut on the machine to adjust the vertical position of the bite thereby to vary the drop height of the signatures into the hopper.

4,180,260
EXERCISE DEVICE
Fred Slagle, 1701 Mentor Ave., Painesville, Ohio 44077
Filed Sep. 22, 1977, Ser. No. 835,803
Int. Cl.[2] A63B *69/18*
U.S. Cl. 272—97 **4 Claims**

1. A balance training device for a skier comprising a support leg configured to rest on a support surface,

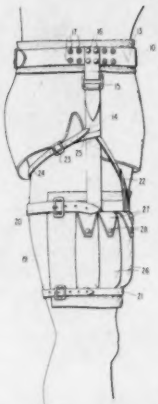
a balance board,

means to support one end portion of said balance board on said support leg above said support surface at a plurality of positions thereon, with the other end on the support surface permitting limited lateral rocking motion of the board with respect to said support leg and the support surface, said means including a through slot formed in said one end portion of the board configured to slide over said leg, and peg means to support the board on said leg, said leg including a plurality of holes arranged for different vertical and horizontal positions of said peg means with respect to said board, and said peg means removably replaceable in said holes to vary the position of support of said board,

means to interconnect said board and said leg to prevent collapse,

and foot engaging means on said board.

4,180,261
EXERCISING DEVICE FOR RUNNERS
Leigh E. Kolka, R.R. #2, Box 145A, Fox Rr. Dr., Plano, Ill. 60545
Filed Jun. 23, 1978, Ser. No. 918,590
Int. Cl.[2] A63B *23/04*
U.S. Cl. 272—119 **5 Claims**



1. An exercising device for runners comprising a support belt adapted to encircle the waist of a runner, a pair of side substantially vertical adjustable length suspension straps dependingly secured to opposite sides of the support belt adjacent to the hips, and thigh weight assemblies secured supportingly to said side suspension straps and being flexible circumferentially of the thighs and adapted to extend about the fronts of the thighs, and thigh girth adjusting means on said thigh weight assemblies whereby the assemblies can be made to adhere snugly to the thighs during running while receiving primary support through said side suspension straps from said support belt.

4,180,262
TENNIS SERVING TOSS AID
Pericles Gabrielidis, 13643 Hatteras St., Van Nuys, Calif. 91401
Filed Feb. 16, 1978, Ser. No. 878,303
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **5 Claims**

1. A tennis serving toss aid comprising:

a ring;

interior wall defining a circular interior opening, said opening being two-and-three-quarters inches in diameter to closely receive a tennis ball and prevent wobble of said ball within said ring and to permit a tennis ball to extend down through the opening so as to rest upon the palm of the hand and initially guide said ball during its release; and

said ring further including an exterior surface means for

holding in the tossing hand of a tennis player, said external surface being for holding the fingers in a tennis serving toss position in which the fingers are positioned like a cup and out of engagement with a tennis ball while the tennis ball rests on the palm of the hand.

4,180,263

TENNIS RACQUETS

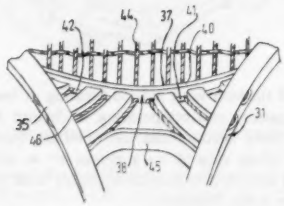
Robert C. Haines, Huddersfield, England, assignor to Dunlop Limited, London, England

Filed Feb. 8, 1978, Ser. No. 876,049

Claims priority, application United Kingdom, Feb. 17, 1977, 06597/77; Apr. 21, 1977, 16556/77

Int. Cl.[2] A63B *49/00*

U.S. Cl. 273—73 G **17 Claims**



1. A throat piece for a tennis racquet having a frame defining an open throat, the throat piece having two generally parallel major faces bounded by a top edge, a bottom edge and two side edges, the side edges being shaped complementary to said frame to fit in the throat area of said racquet so that the top edge of the throat piece completes the stringing area of the racquet, said throat piece having a series of indentations across its width, said indentations defining substantially parallel ridges and depressions on each of the two major faces of the throat piece, said indentations having ends facing toward said top edge and following generally curved paths extending downwardly and aligned to receive longitudinal strings of the racquet and to divert them from the longitudinal direction into the racquet frame, and wherein said ridges on one of said major faces constitute said depressions on the other major face and vice versa.

4,180,264

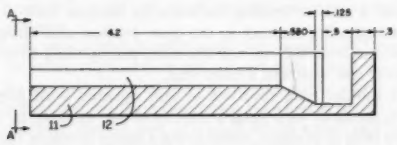
RACKET HANDLE AND METHOD OF MAKING SAME

Mark L. Robinson, Andover, Mass., assignor to Acro, Inc., Stoneham, Mass.

Filed Apr. 25, 1977, Ser. No. 790,552

Int. Cl.[2] A63B *49/08*

U.S. Cl. 273—73 J **7 Claims**



1. A method of making handles for game rackets comprising,
inserting a stretchable handle grip covering into a cavity of a mold corresponding substantially to the size and shape of the desired handle,
filling said covering inside said cavity with expandable plastic material,
inserting the handle extremity of the racket into said covering,
causing said plastic material to expand and stretch the covering to the shape of the mold,
allowing the plastic to harden into a handle around said handle extremity bonded to and covered by said covering with the hardened plastic filling all the region between the handle extremity and the surrounding covering which covering forms the outer surface of said handle,
and disengaging said mold from said handle and grip covering assembly.

5. In a game racket having a frame, a plastic handle having flat intersecting surfaces and finished shape conforming to that of a mold in which the handle was molded and made of foam-in-place plastic bonded to a stretchable grip surrounding the hardened expanded foam-in-place plastic and bonded thereto by the expanding and hardening of said foam-in-place plastic,
said stretchable grip prior to expansion of said foam-in-place plastic having a shape different from said finished shape and after expansion corresponding substantially to said finished shape and being the outer surface of said handle,
the extremeties of said frame being seated in said foam-in-place plastic which plastic fills essentially the entire region between said extremeties and said stretchable grip.

4,180,265

IMPLEMENT FOR STRIKING A BALL

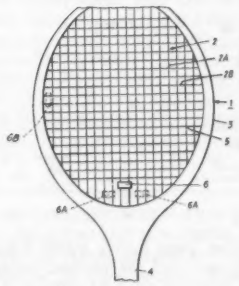
Adolf Staufer, Ried im Innkreis, Austria, assignor to Fischer Gesellschaft m.b.H., Ried, Austria

Filed Jul. 15, 1977, Ser. No. 816,032

Claims priority, application Austria, Mar. 31, 1977, 2263/77

Int. Cl.[2] A63B *51/00*

U.S. Cl. 273—73 D **11 Claims**



1. An implement for striking a ball, comprising a handle, a head member connected to the handle and defining a hoop having sides, and a striking surface enclosed by said hoop and constituted by parallel longitudinal strings and parallel transverse strings, the longitudinal and transverse strings intersecting in a region spaced from the sides of the hoop, and preformed vibration-absorbing means insertable between two parallel strings for mechanically interlocking at least two of said parallel strings in a region between the intersecting strings and the sides of the hoop, the vibration absorbing means being spaced from the sides of the hoop.

4,180,266

RING TOSS GAME

Fernand Morin, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

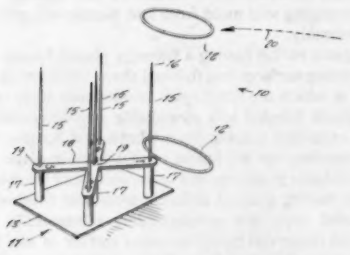
Filed Jan. 25, 1977, Ser. No. 762,314

Int. Cl.[2] A63B *67/06*

U.S. Cl. 273—100 **4 Claims**

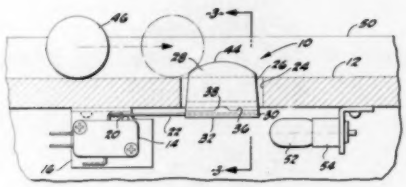
1. A ring toss game comprising a base with a flat upper surface having secured thereto and extending at right angles to said base spaced spikes in combination with a member comprising spaced cross arms having holes therethrough adapted to slidably receive said spikes, in further combination with sleeves mounted loosely about each spike and bearing against said

surface at a lower end and supporting said member at an upper end, in combination with a plurality of rings of diameter to



encompass at least two spikes, whereby said rings will be supported about a spike on said member spaced from the base when tossed thereon.

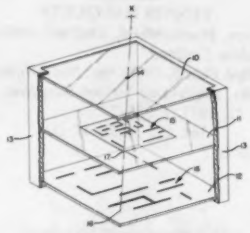
4,180,267
BALL ROLLOVER SWITCH ASSEMBLY
Geoffrey A. J. Harrop, Saratoga, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Jan. 11, 1978, Ser. No. 868,672
Int. Cl.[2] A63B 71/00
U.S. Cl. 273—127 R **4 Claims**



4. An amusement game having means defining a playfield over which balls are rolled, the playfield having a slot therein, the combination with said playfield defining means of a switch mounted below the playfield and having an operating blade which is movable between raised and lowered positions and projects across said slot, an actuator body having an enlarged base formed with a horizontally extending channel, said actuator body being mounted on the blade with the blade secured within the channel, said body having a vertically elongate nose which extends upwardly through the slot of the playfield, said nose having an arcuate, upwardly-convex rim which projects above the upper surface of the playfield when the blade is in its raised position, said rim forming a camming surface which is contacted by a ball moving across the playfield for depressing the actuator body and moving the blade toward its lowered position, said body being formed of a material transmissive to light, and light source means mounted below the playfield for directing light through the body to illuminate the nose portion as viewed from the above playfield.

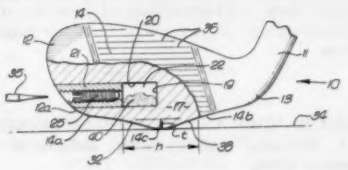
4,180,268
MAZE GAME
Nathaniel E. Brooks, 8901 Seneca La., Bethesda, Md. 20034
Filed Mar. 21, 1978, Ser. No. 888,747
Int. Cl.[2] A63F 9/06
U.S. Cl. 273—153 R **5 Claims**

1. A three-dimensional amusement device comprising at least three substantially planar elements, means for maintaining said substantially panar elements in substantially parallel spaced relationship, said at least three elements including first and second spaced elements and at least one intermediate element spaced from said first and second elements and disposed therebetween, one of said first, second and intermediate elements being provided thereon with indicia in the form of a sighting point representing an object to be visually moved through a maze pattern of open and closed passageways and the others of said first, second and intermediate elements being



each provided thereon with indicia forming at least a portion of the maze pattern and cooperating to delimit a total maze pattern, said first, second and intermediate elements being arranged for being viewed by a player so as to represent a sighting point disposed within an apparent total maze pattern formed by the other elements.

4,180,269
WEIGHT ADJUSTMENT OF GOLFING IRON HEADS
Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa Del Rey, Calif. 90271
Filed May 8, 1978, Ser. No. 903,813
Int. Cl.[2] A63B 53/04
U.S. Cl. 273—171 **3 Claims**

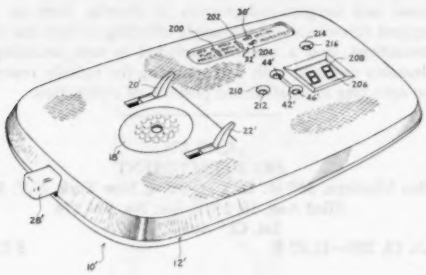


1. In a golf iron,
(a) a metallic head having a toe and heel, a front face to strike a golf ball, a rear side, the head having an elongated base portion extending between the toe and heel,
(b) an opening formed in the base portion and elongated intermediate the toe and the heel, the opening having an inner end wall and a bore wall,
(c) a tubular plug received in said opening with gripping engagement with head metal about the opening to retain the plug in position, there being a space between the plug and said inner end wall, the plug containing a through port to pass head weighting material from the exterior through the plug and into said space after the plug is in place, said material being comminuted,
(d) and insert means threadably received in said port to close said port, the insert means having an innermost end,
(e) said space generally centrally located between the toe and heel,
(f) the plug defining an interior annular shoulder against which an end portion of the insert means is jammed to locate said innermost end proximate the inner end of the plug.

4,180,270
GOLF PUTTING TRAINING APPARATUS

Steven M. Long, 17151 Almaden Rd., San Jose, Calif. 95120

Filed Sep. 19, 1977, Ser. No. 834,183
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 R 4 Claims

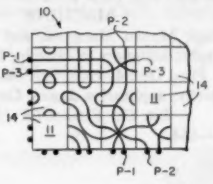


1. A golf putting training apparatus comprising:
a housing;
a first detector for developing a club toe detect signal when the club crosses a first point located on a first side of an intended line of club travel over said housing and including first switch means mounted within said housing and having a first pivotable actuating member extending through a first opening in said housing, said first actuating member being engageable be said club and movable between a first switch position and a second switch position;
a second detector for developing a club heel detect signal when the club crosses a second point located on the other side of said intended line of travel, and including second switch means mounted within said housing and having a second pivotable actuating member extending through a second opening in said housing, said second actuating member being engageable by said club and movable between a first switch position and a second switch position, said first and second points being disposed along a line transverse to said intended line of club travel;
a third detector for developing a third club detect signal where the club crosses a third point positioned so as to be crossed by the club after it has crossed said first and second points;
reset means disposed within said housing and having an actuating projection extending through a third opening in said housing for engagement by the foot of a user, said actuating projection being movable between a rest position and a reset position and operable to move said first and second actuating members from said second switch positions to said first switch positions when said actuating projection is moved from said rest position to said reset position;
circuit means connected to said first and second detectors for receiving said first and second club detect signals and for generating a first display driving signal which is commensurate with the difference between a predetermined characteristic of said first club detect signal and a corresponding characteristic of said second club detect signal, said circuit means being further connected to said third detector for receiving said third club detect signal and for generating a second display driving signal which is proportional to the time delay between the passing of the club head over one of said first and second points and said third point;
display means connected to said circuit means for receiving said first display driving signal and for providing a numerical indication of the degree of misalignment of the club head relative to said transverse line as it crosses thereover, said display means further receiving said second display driving signal and providing in response thereto an indication of the club head speed as it crosses said transverse line.

4,180,271
SQUIGGLE GAME

Thomas McMurchie, 11148 Forest Edge Dr., Reston, Va. 22090

Filed Jul. 10, 1978, Ser. No. 923,312
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—275 7 Claims

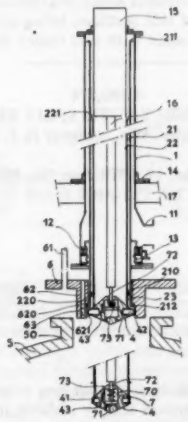


1. A game comprising:
a game board having a quadrangular playing area that is divided into a plurality of equal sized quadrangles and having a border between the outer edges of the game board and said quadrangular playing area;
a plurality of start marks located on said border adjacent each one of the outer ones of said plurality of equal sized quadrangles;
a plurality of playing cards, each one of said plurality of playing cards being of equal size and shape to the size and shape of each one of said plurality of equal sized quadrangles and having a plurality of line segments imprinted on one surface thereof, each one of said line segments having both of its ends terminate at an edge of the said playing card on which that line segment is imprinted; and
a plurality of individually distinguishable playing pieces.

4,180,272
SEAL FOR SEALING BETWEEN TWO TELESCOPIC TUBES AND SEALING DEVICE USING SUCH SEAL

Pierre Heitz, Puteaux, France, assignor to Compagnie d'Etudes et de Realisations de Cybernetique, Fontenay-Sous-Bois, France

Filed Sep. 15, 1978, Ser. No. 942,907
Int. Cl.[2] B65B *3/04;* F16J *15/00*
U.S. Cl. 277—28 6 Claims



1. A sealing device for sealing between two tubes which are slidable one in the other and are movable to a position in which

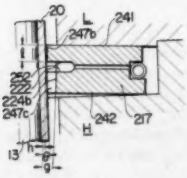
one said tube rests on the other said tube, comprising: an inflatable seal disposed in an annular space provided between said two tubes; means for supplying fluid to said seal for inflating and applying said seal under pressure against the walls of said tubes; and means for controlling said means for inflating said seal directly by the force arising from the resting of said one tube on said other tube.

4,180,273

SEALING DEVICE FOR ROTOR SHAFT OF FLUID MACHINE

Nobuho Takagi; Muneo Maegawa, and Katsutoshi Nii, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 4, 1978, Ser. No. 948,549
Claims priority, application Japan, Oct. 7, 1977, 52-119918
Int. Cl.[2] F16J *9/08, 15/24*
U.S. Cl. 277—154 **16 Claims**



1. A sealing device for the rotor shaft of a fluid machine, comprising an annular sealing box extending circumferentially around said rotor shaft, and an annular solid packing received in and supported by the sealing box, said solid packing including a plurality of circumferentially spaced segments, wherein each of said segments comprises:

two opposing surfaces spaced axially of said rotor, one of said surfaces being disposed adjacent to the low pressure side of said fluid machine, while the other is disposed adjacent to the high pressure side of said fluid machine;

side surfaces spaced circumferentially of said rotor shaft; and

a sliding surface defined by radially inner edges of said opposing surfaces and said side surfaces and adapted to be kept in a sliding contact with the surface of said rotor shaft, said sliding surface having two axial half regions, one of said two axial half regions being adjacent to said one of said opposing surfaces and the other axial half region being adjacent to said the other of said opposing surfaces;

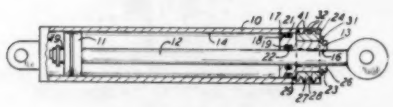
at least an axial portion of said one axial half region, extending between said side surfaces, being adapted to be in an initial sliding contact with said rotary shaft.

4,180,274

CYLINDER ASSEMBLY WITH SPLIT RING RETAINER

Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 14, 1978, Ser. No. 896,462
Int. Cl.[2] F16J *15/18*
U.S. Cl. 277—192 **7 Claims**



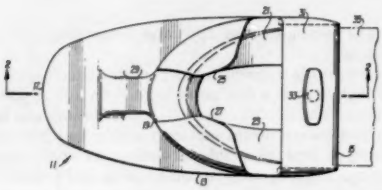
1. A cylinder assembly with split ring retainer, comprising a hollow cylinder, a piston snugly slidable in said cylinder, a piston rod extending into said cylinder and attached with said piston, a cylinder head attached to one end of said cylinder and surrounding said rod for slidably supporting said rod, a split ring having radial segments and being located at least at one of the connections between said piston and said rod and between said cylinder head and said cylinder for effecting the connection thereat, said one of said rod and said cylinder each having a plurality of radially faced tongues-and-grooves extending therealong in side-by-side relation, said split ring being of an axial length to extend across all said tongues-and-grooves and having its own tongues-and-grooves nested with the first-mentioned said tongues-and-grooves to thereby form an interengaged connection for releasably effecting at least one of said connections, and a member included in said assembly and releasably engaged with said split ring for radially restricting said split ring in its aforesaid position of connection.

4,180,275

SKI ATTACHMENT

Allan Montoya, 345 W. 58th St. #5M, New York, N.Y. 10019

Filed Aug. 16, 1978, Ser. No. 934,274
Int. Cl.[2] A63C *11/00*
U.S. Cl. 280—11.37 E **5 Claims**



1. A removable ski extender for attachment to a ski tip comprising

an arcuate snowfoil curved at one end thereof;

an arcuate platform secured to the other end thereof and extending above said snowfoil and in the direction of said curved end, said platform having substantially the same curvature as said ski tip;

means attached to said arcuate platform for retainably mating with the edges of said ski tip;

a bridge extending laterally across said other end of said snowfoil; and

means in said bridge for removably securing said ski tip to said arcuate platform.

4,180,276

BACK-TO-FACE REVERSIBLE PUSH HANDLE OF A BABY CARRIAGE

Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1977, Ser. No. 792,988
Claims priority, application Japan, Jun. 23, 1976, 51-83355[U]
Int. Cl.[2] B62B *3/02*
U.S. Cl. 280—47.36 **4 Claims**

1. A baby carriage frame with a reversible push handle comprising:

a front leg;

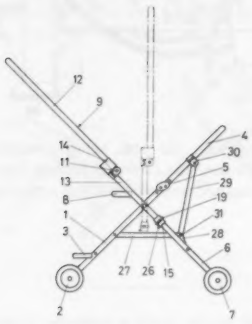
a rear leg pivotally connected to said front leg, wherein said front and rear legs cross each other at the point of pivotal connection;

a handle rod, rotatably connected to said front and rear legs at the same location said front and rear legs are pivotally connected;

a leg and rod supporting means, connected to said handle rod, for supporting said rear leg and said handle rod parallel to each other when said handle rod is positioned parallel to said rear leg, and for disengaging from said rear leg when said handle rod is pivoted toward the top of said front leg, out of parallel alignment with said rear leg, and for supporting said front leg and said handle rod parallel to each other when said handle rod is positioned parallel to said front leg, and for disengaging from said front leg

when said handle rod is pivoted toward the top of said rear leg, out of parallel alignment with said front leg;

a turning lock means, connected to said leg and rod supporting means, for locking and unlocking said handle rod and rear leg in parallel alignment in said leg and rod supporting means when said handle rod and said rear leg are in



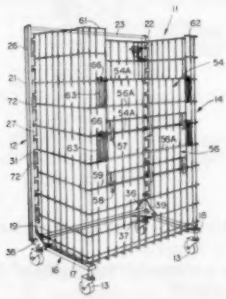
parallel alignment supported by said leg and rod supporting means, and for locking and unlocking said handle rod and said front leg in parallel alignment in said leg and rod supporting means when said handle rod and said front leg are in parallel alignment supported by said leg and rod supporting means.

4,180,277

MOVABLE STORAGE AND/OR DISPLAY APPARATUS

Victor R. Romero, Sheridan Township, Calhoun County, Mich., assignor to Eagle Picher Industries, Inc., Cincinnati, Ohio

Filed Apr. 7, 1978, Ser. No. 894,429
Int. Cl.[2] B62B *3/02*
U.S. Cl. 280—79.3 **13 Claims**



1. A movable apparatus for storing and/or displaying objects, comprising:

wheeled base means adapted to be moved along a support surface;

a pair of upright posts mounted on said base means and extending upwardly therefrom, said posts being parallel and being spaced a selected distance apart;

a basket mounted on said base means and extending frontwardly thereon relative to said posts, said basket comprising a bottom wall, a front wall, a pair of side walls and a rear wall which define a rectangular compartment for holding objects, said side walls and said bottom wall of said basket being hingedly connected to said front wall so that said side walls and said bottom wall can be unfoided from a storage position in which said walls are substantially parallel to each other to an erected position in which said walls define the bottom, front and sides of the rectangular compartment, said rear wall being separate from said bottom wall, said side walls and said front wall, and releasable latch means for releasably securing said rear wall to the rear edges of the side walls of the basket in the erected condition thereof;

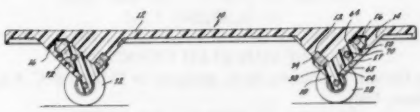
and connecting means on said posts for releasably engaging said basket.

4,180,278

SKATEBOARD

Clifford C. Gottlieb, Sherman Oaks, Calif., assignor to Sport-Fun, Inc., Los Angeles, Calif.

Filed Jun. 5, 1978, Ser. No. 912,434
Int. Cl.[2] A63C *17/00*
U.S. Cl. 280—87.04 A **17 Claims**



7. A skateboard including

a platform made from a plastic material and including integral flange members extending downwardly from the bottom surface of the platform at opposite ends of the platform,

each of the flange members including an opening extending upwardly through the flange member toward the platform,

wheel support members made from a plastic material, each of the wheel support members including an integral post extending upwardly into the opening in an associated one of the flange members in an interlocking relationship with the flange member for mounting the wheel support member on the flange member,

means for interlocking the posts within the openings in the flange members, and

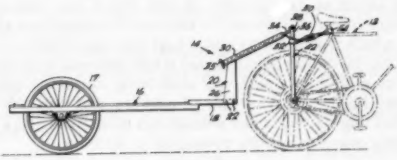
shock absorbing material supported by each of the flange members and the associated wheel support member at a position removed from to the post.

4,180,279

BICYCLE HITCH FOR CONNECTION TO A TRAILER

Joseph W. Belliveau, Sr., 3701 SW. 88 Ct., Miami, Fla. 33165

Filed May 30, 1978, Ser. No. 910,376
Int. Cl.[2] B62K *27/12*
U.S. Cl. 280—204 **5 Claims**



1. For a two wheeled bicycle type vehicle having a single rear wheel and rear axle, a trailer hitch, said hitch comprising a vertical fork of a length greater than the radius of the rear wheel and said fork having a lower end and an upper end, said lower end being adapted for attachment to the rear wheel axle of a bicycle and said upper end comprising an upstanding vertical turning stem;

means to mount the fork to the rear axle;

a first sleeve about the turning stem;

a rigid elongate member having a first end and a second end and having a longitudinal axis, said rigid elongate member

extending rearwardly and downwardly from the first sleeve at an angle between the vertical of between 64 and 65 degrees and of a length sufficient to extend beyond the vertical tangent to the rear bicycle wheel, said member being rigidly attached to said first sleeve at the first end;

an elongate second sleeve about the member, said second sleeve being of a length shorter than said member and rotatable and slidable along the rigid member, said second sleeve having a front and rear end, stop means to limit sliding movement along the member of said second sleeve;

a depending hitch member having a vertical portion connected rigidly to the second sleeve rearwardly of the bicycle wheel and adjacent the rear end and of a length extending to the centerline of the bicycle wheels for attachment to a draw bar of a trailer; and

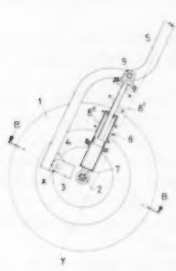
means to anchor the fork in a vertical attitude.

4,180,280

FRONT-WHEEL SUSPENSION FOR TWO- OR THREE-WHEELED VEHICLES

Carlo Doveri, Pontedera, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Sep. 27, 1977, Ser. No. 837,382
Claims priority, application Italy, Feb. 10, 1977, 20164 A/77
Int. Cl.[2] B62K *21/02*
U.S. Cl. 280—277 **5 Claims**



1. In a wheel suspension system: a device for imparting steering movement to a wheel, said wheel being rotatably mounted on a single rigid arm for rotation relative to said arm about the axis of the wheel and said arm extending in a plane normal to said wheel axis; means pivoting said arm at a location spaced from said wheel axis to said steering device so that said arm can swing in said plane; a telescopic leg extending substantially perpendicular to said arm, said leg including resilient means biasing said leg toward an extended position, said leg having an upper end pivoted to said steering device for movement about an axis parallel to said wheel axis and said leg having a lower end pivoted to said arm for movement about an axis which is parallel to said wheel axis and which coincides with the pivot axis between said wheel and said arm, the pivot axes of said upper and lower ends being normal to and intersecting the longitudinal axis of said leg and said wheel axis intersecting a straight line joining said pivot axes; and a wheel-braking assembly rigidly connected to said leg.

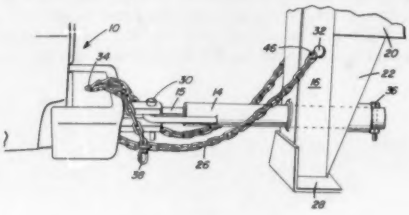
4,180,281

SAFETY CHAIN ARRANGEMENT FOR TOWED VEHICLES

Christian T. Tertinek, Canandaigua, N.Y., assignor to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,525
Int. Cl.[2] B60D *1/12*
U.S. Cl. 280—457 **10 Claims**

1. In a safety arrangement for securing a towing vehicle to a towed vehicle having a front post attached to a main beam, a tow pole attached to said front post, and hitching means connecting said towing vehicle to said tow pole, the improvement comprising a safety chain, in combination with attaching means on the towed vehicle, wherein the attaching means



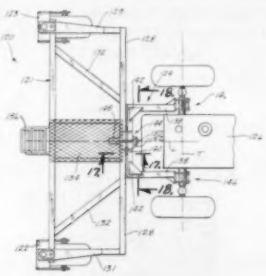
includes the front post, the post being compartmented and having lateral keyholes, said keyholes having their slots angled forward and downward and adapted for receiving said chain.

4,180,282

FRONT MOUNTED GROUND SUPPORTED TRACTOR ATTACHMENT

James Henning, R.R. 1, Hennepin, Ill. 61327

Continuation-in-part of Ser. No. 712,099, Aug. 5, 1976, Pat. No. 4,106,795. This application May 24, 1978, Ser. No. 908,812
Int. Cl.[2] B60D *3/00*
U.S. Cl. 280—481 **10 Claims**



1. A front mounted vehicle attachment steerable with and pushed by a vehicle comprising:

a portable frame positionable forwardly of the vehicle,

a pair of caster wheels,

means for supporting the caster wheels on the frame at transversely spaced positions relative to the vehicle,

a drive linkage between the frame and vehicle,

means for providing a swivel connection between the drive linkage and frame for pivotal movement of the frame about a generally longitudinal axis relative to the vehicle, and

means for providing a pivotal connection between the vehicle and drive linkage for pivotal movement of the frame about a generally transverse axis relative to the vehicle,

said drive linkage being engaged against said portable frame whereby pushing force of the vehicle is transmitted to the portable frame by the drive linkage substantially independently of said swivel connection means, and

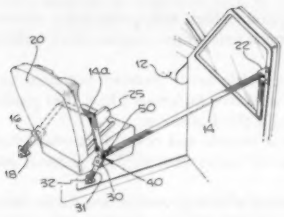
said swivel connection means securing said frame and drive linkage in longitudinally spaced-apart relation for pivotal movement of the frame free of obstruction with said drive linkage.

4,180,283

CHILD SAFETY SEAT RESTRAINT ADAPTER MEANS

Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, San Fernando, Calif.

Filed May 17, 1978, Ser. No. 906,880
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—802 5 Claims



1. A child safety restraint adapter means for restraining a child safety seat on a vehicle seat in association with a preinstalled passive diagonal torso safety belt anchored at one end outboard of the vehicle seat on the vehicle door, extending across the vehicle seat and being anchored at an opposite end inboard of the vehicle seat, said adapter means comprising:

an auxiliary safety belt buckle and means for anchoring said buckle outboard of said vehicle seat;

an auxiliary tongue plate means for releasable engagement with said auxiliary buckle; and

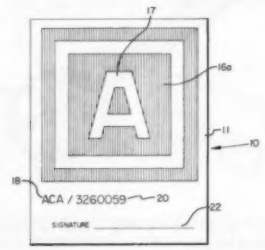
connector means for connecting said tongue plate means in a fixed relation to said preinstalled diagonal torso safety belt intermediate its ends whereby said child safety seat may be restrained on said vehicle seat by passing portions of said safety belt inboard of said connector means over said child seat, when positioned on the passenger seat, and engaging said auxiliary tongue plate means with said auxiliary buckle.

4,180,284

TAG FOR IDENTIFYING LUGGAGE AND METHOD OF USING SAME

James E. Ashley, 19626 SE. 395th Ave., Sandy, Oreg. 97055

Filed Nov. 9, 1977, Ser. No. 849,807
Int. Cl.[2] G09F *3/00*
U.S. Cl. 283—20 2 Claims



1. A kit for marking, identifying and controlling transport of luggage comprising:

(a) a tag including a planar label, means for attaching said label to a piece of luggage, said label having one of a selected group of distinctive geometrical shapes defined thereon, said geometrical shape being sufficiently large to be identifiable from a location separate from said piece of luggage, said geometrical shape being colored in one of a selected group of colors, and an alphanumeric character displayed on said label within the border of said geometrical shape;

(b) a user card having indicated thereon the same geometrical shape, color, alphanumeric character and identifying letters as said tag; and

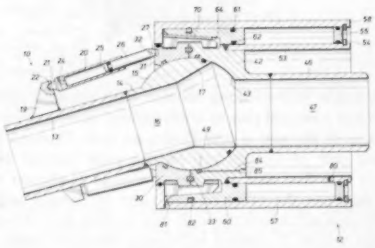
(c) a postcard, addressed for return to its predetermined supplier, having imprinted thereon the same identifying letters as on the tag, and containing spaces for placement of the user's personal identification.

4,180,285

ARTICULATED BALL CONNECTOR FOR USE WITH PIPELINE

Bobby J. Reneau, P.O. Box 11625, Houston, Tex. 77016

Filed May 11, 1978, Ser. No. 904,785
Int. Cl.[2] F16L *27/04*
U.S. Cl. 285—261 7 Claims



1. An apparatus for connecting two pipes together, comprising:

(a) a spherical ball having an axial passage therethrough and adapted to be joined in fluid communication with a first pipe;

(b) a receptacle means having an axial passage therethrough and formed of a female cavity having a surface matching that of said ball which surface is less than a hemisphere and which encircles said ball by at least 180 degrees, said receptacle means adapted to be joined in fluid communication with a second pipe;

(c) clamping means for holding said ball in said receptacle means and aligning the axial passages thereof to enable fluid communication between the first and second pipes;

(d) said clamping means securing said ball in said receptacle means by clamping said ball on its outer surface at a location on said ball on the exposed side opposite the hemisphere in said receptacle means and wherein said clamping means includes:

(1) a circular first ring around said ball having a diameter enabling it to contact said ball without passing over said ball;

(2) an external protruding lip on said receptacle means; and

(3) means for locking said ring to said lip wherein said locking means comprises

(4) an encircling second ring having a pair of spaced, internally directed shoulders which are spaced to encircle and abut said first ring and said lip in a side-by-side relationship.

4,180,286

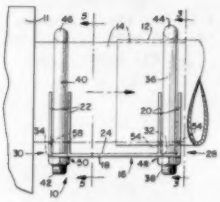
EXHAUST PIPE SAFETY CLAMP ASSEMBLY AND COMBINATION

Tom Ginter, Jr., Box 193, Clearfield, Ky. 40313

Filed May 12, 1978, Ser. No. 905,608
Int. Cl.[2] F16L *13/14*
U.S. Cl. 285—328 6 Claims

1. A clamp assembly for securing two pipe portions of an

automobile exhaust system together in overlapping relationship with each other, said assembly comprising in combination a rigid bracket having a rigid base plate of substantially constant width with two pairs of rigid upstanding flanges extending from one side thereof, each of said flanges being substantially fully coextensive with said plate for the entire lateral width of said base plate and each of said flanges having a generally concave cut-out for reception of an approximately semi-circular portion of a pipe element, one of said pairs of flanges being disposed adjacent one end of said base plate, the other of said pairs of flanges being disposed adjacent the end of said base plate opposite from said one end, said base plate



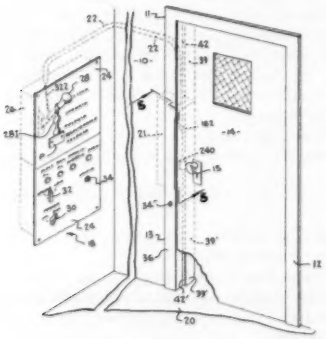
having a first pair of holes located between said one pair of flanges and a second pair of holes located between the other of said pairs of flanges, a first U-shaped bolt disposed between said one pair of flanges and having ends thereof extending through said first pair of holes, a second U-shaped bolt disposed between the other of said pairs of flanges and having ends thereof extending through said second pair of holes, said first and second U-shaped bolts each having a bight portion adapted to embrace a side of a pipe element opposite from the side that would be received on the concave cut-out of the upstanding flanges, and means for applying pressure to and securing said U-shaped bolts at the ends thereof.

4,180,287

CELL LOCKING SYSTEM

David H. Youngblood, and Quentin H. Young, both of San Antonio, Tex., assignors to Southern Steel Company, San Antonio, Tex.

Filed Apr. 6, 1978, Ser. No. 894,129
Int. Cl.[2] E05C 1/08
U.S. Cl. 292—144 **62 Claims**



1. A door control system including:

a door frame;

a door mounted in said door frame;

a dead bolt mounted in said door frame for movement between an extended door locking position in which one end of the dead bolt extends into a mating opening in the door and a retracted unlocking position;

a lock bolt mounted in the door frame for movement between an extended door locking position in which the lock bolt extends into a mating opening in the door and a retracted unlocking position;

a control station spaced from said door frame;

control effecting connection means extending between said control station and said door frame;

selectively operable dead bolt actuator means in said door frame for actuating said dead bolt to effect movement of said dead bolt to either its extended position or its retracted position;

selectively operable lock bolt positioning means mounted in said door frame unit for moving said lock bolt to its retracted position;

a manually operable lever member mounted in said control station for selective movement to a first position, a second position and a third position;

a movable bolt release and control member mounted in said door frame for movement to first, second, and third positions;

said latch control effecting connection means being connected to said bolt control actuator member and including mechanical connector means extending between said manually operable lever member and said bolt release and control member for positioning said bolt release and control member in its first, second or third positions in response to the positioning of said manually operable lever member respectively in its first, second or third positions;

dead bolt release means engageable with means on said bolt release and control member for moving said dead bolt to its retracted position in response to movement of said bolt release and control member to its third position;

lock bolt release means responsive to movement of said bolt release and control member to its third position for moving said lock bolt to its retracted position;

lock bolt biasing means for urging said lock bolt toward its extended latching position; and

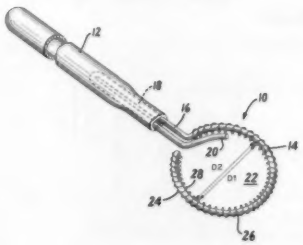
lock bolt drive override means responsive to the positioning of said dead bolt in its extended door latching position for preventing operation of said lock bolt positioning means.

4,180,288

GOLF BALL RETRIEVER

Paul T. Sievers, 986 Fenworth Blvd., Franklin Square, N.Y. 11010

Filed Feb. 21, 1978, Ser. No. 879,394
Int. Cl.[2] B66F 11/00
U.S. Cl. 294—19 A **7 Claims**



1. A ball retriever for retrieving a ball comprising:

(a) an elongated shaft;

(b) a generally circular loop having an effective inner diameter smaller than the diameter of said ball;

(c) means for connecting said loop to said shaft;

(d) resilient means for permitting the enlargement of said inner diameter by the passage of said ball partly through said loop, said resilient means partially closing about said ball after the passage of the widest part thereof through said loop;

(e) the plane of said loop and the axis of said shaft being substantially parallel;

(f) at least one finger means for stopping and holding said

ball after its diamater has passed through said loop but before the entire ball has passed through said loop; and

(g) said at least one finger means extending at least part way across said loop.

4,180,289

GARDENING TOOL

Eric N. Faine, 63 Hill St., Northgate, Australia

Filed Jun. 28, 1978, Ser. No. 920,063

Claims priority, application Australia, Oct. 6, 1977, 1963/77

Int. Cl.[2] A01B *1/00*

U.S. Cl. 294—53.5 **3 Claims**

1. A gardening tool having a substantially straight and normally upright handle, a pedal connected to the normally lower end of the handle, a tool head, pivot means interconnecting said handle and the tool head whereby the tool head may be pivoted about an axis transverse with respect to said handle and tool head, and a torsion spring having a first part thereof fixed to the handle and a second part thereof fixed to the tool head with an intermediate part associated with the pivot means, the interconnection between the tool head and the handle by said pivot means being such that the tool head cannot be pivoted past a first position wherein the handle is in substantial alignment with the tool head and a second position wherein the tool head is at an obtuse angle to said handle, said torsion spring urging said handle toward the first position.

4,180,290

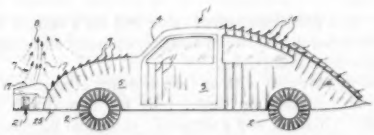
PROPELLED APPARATUS HAVING SURFACE MEANS FOR DEVELOPING INCREASED PROPULSION EFFICIENCIES

Hilbert F. P. Drews, 5640 S. 76th St., Greendale, Wis. 53219

Continuation-in-part of Ser. No. 631,703, Nov. 13, 1975, abandoned. This application May 16, 1977, Ser. No. 798,417

Int. Cl.[2] B64C *1/38;* **B62D** *35/00*

U.S. Cl. 296—1 S **6 Claims**



1. In a craft adapted to be moved through a fluid and having a forward wall portion moving through and parting the fluid as the craft moves through the fluid and having a trailing portion, said forward wall portion of the craft defining a fluid impacting surface, said surface including a substantial plurality of adjacent and parallel waveshaped elongated flutes, each of said flutes extending as an elongated flute with a constant cross-section along said forward wall portion, each of said flutes having an essentially similar cross-section to that of the other flutes and having a trough portion extending upwardly and rearwardly to a crest portion developing an outwardly directed air stream, the crest portion of each flute overlying the trough portion of the flute rearwardly adjacent thereto to define a fluid pocket beneath the crest portion, said flutes being connected by a thin mounting base member, said flutes and base member being formed as an integral molded plastic element, and an adhesive attachment means securing said plastic element to said forward wall portion.

4,180,291

MINERAL MINING INSTALLATION

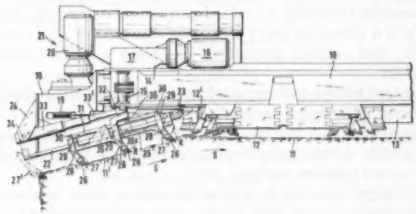
Armin Löbbe, Lünen, and Hans-Jürgen Penzek, Oberaden, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,483

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656792

Int. Cl.[2] E21C *27/32*

U.S. Cl. 299—34 **24 Claims**



1. A mineral mining installation for winning material in a "stable-hole" region of a longwall face, the installation comprising a guide, a base slidably mounted on the guide, at least one tool carrier pivotally mounted on the base, lost reciprocating motion linkage affixed to each tool carrier, drive means engaging the lost reciprocating motion linkage for reciprocating the base along the guide and for pivoting each carrier between an operating position and a non-operating position, the drive means having a working stroke which initially pivots each carrier from its non-operating position to its operating position and then causes the base and carrier(s) to execute a working stroke along the guide, and the driving means having a return stroke which initially causes each carrier to pivot from its operating position to its non-operating position and then causes the base and carrier(s) to execute a return stroke along the guide.

4,180,292

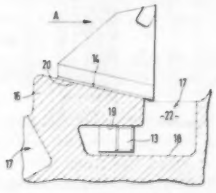
ROCK MILLING CUTTER TONGUE AND SLOT CONNECTED

Erik A. Persson, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Feb. 27, 1978, Ser. No. 881,603

Int. Cl.[2] E21C *35/18*

U.S. Cl. 299—92 **5 Claims**



1. An assembly of a milling cutter head and cutter tool holders for a rock drilling machine, each holder mounted by a tongue and groove connection comprising:

an outwardly open groove formed in said cutter head, said groove including opposite side walls each extending from a front end to a rear end of said groove, one of said side walls being substantially straight along its height, said other side wall including a first projection extending laterally toward said one side wall,

said first projection including a first contact surface forming therebeneath an undercut portion of said groove extending in a front-to-rear direction,

said first projection terminating short of said front end of said groove to define an enlarged opening,

said cutter head including a second contact surface spaced outwardly of said first contact surface and extending at an angle relative thereto, and

a tongue comprising an extension of said tool holder, said extension including opposite side walls spaced by a distance less than the distance between said first projection and said one side wall of said groove, one of said side walls of said extension extending substantially straight to the end of said extension, the other of said side walls of said extension including a second projection extending laterally in a direction away from said one side of said extension, said second projection including a third contact surface,

said tool holder including a fourth contact surface spaced from said third contact surface and extending at an angle relative thereto, which spacing and angle corresponds substantially to that defined by said first and second contact surfaces,

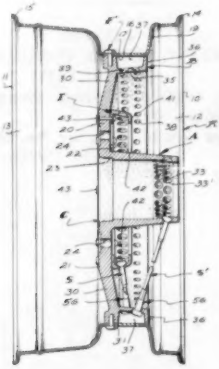
said enlarged opening to said groove being sized to receive said extension and said second projection such that upon movement of said tool holder toward said rear end of said groove, said extension travels between said first projection and said one wall of said groove and said second projection travels along said undercut portion of said groove, with said first and third contact surfaces and said second and fourth contact surfaces contacting one another to wedgingly secure said tool holder to said cutter head.

4,180,293

SIMULATED SPOKE WHEEL STRUCTURE

Curtis Norris, 502 W. Aurora, Santa Ana, Calif. 92707, and Delmer D. Scott, Montecito, Calif., assignors to Curtis Norris, Santa Ana, Calif.

Filed Aug. 28, 1978, Ser. No. 937,484
Int. Cl.[2] B60B *1/00*
U.S. Cl. 301—54 **10 Claims**



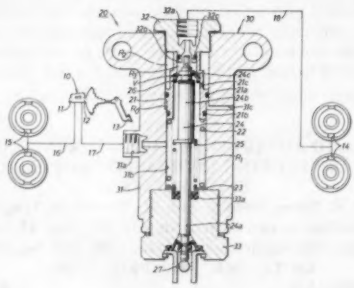
1. An automobile wheel including an elongate outer annular tire engaging rim with front and rear ends and an axially extending annular, radially inwardly disposed wheel center mounting surface intermediate its ends, a cast metal wheel center with a flat, radially extending central disc with front and rear surfaces and an annular radially extending outer portion, said disc has a central axially extending dust-cap receiving aperture, a plurality of axially extending mounting stud openings in radial and circumferential spaced relationship about the aperture and a forwardly projecting tubular cone radially inward of the stud openings and communicating with the aperture; said cone has an open front end and an annular series of radially extending front spoke openings spaced axially forward of said disc, said outer portion has a forwardly projecting outwardly opening channel portion with an axially extending inner wall and a radially extending front wall about the perimeter of said outer portion inward of and opposing said wheel center mounting surface; said inner wall has annular series of radially extending front and rear spoke openings; an annular spoke mounting ring with an annular series of radially extending rear spoke openings is on and projects forwardly from the wheel center in radial spaced relationship between the stud openings and the channel portion and spaced axially rearward of said channel portion and the forward portion of said cone, an annular rear series of circumferentially spaced and circumferentially inclined rear spokes extending between the ring and the channel portion with inner and outer ends extending through the rear spoke openings and an annular front series of circumferentially spaced radially and circumferentially inclined front spokes extends between the cone and the channel portion with inner and outer ends extending through the front spoke openings.

4,180,294

FLUID PRESSURE CONTROL VALVE FOR VEHICLE BRAKING SYSTEMS

Hidetoshi Shimizu, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1978, Ser. No. 971,198
Claims priority, application Japan, Dec. 28, 1977, 52-160512
Int. Cl.[2] B60T *13/00*
U.S. Cl. 303—6 C **5 Claims**



1. In a fluid pressure control valve unit for a vehicle braking system incorporated between a master cylinder and rear-wheel brake cylinders, comprising:

a housing provided with an inlet port for connection to said master cylinder, an outlet port for connection to said brake cylinders, and a stepped cylindrical bore including small and large diameter portions in open communication with said inlet and outlet ports respectively;

a stepped sleeve member slidably disposed within said cylindrical bore and engaged at one end thereof with the inner end-wall of said housing to enclose said outlet port, said sleeve member having small and large pressure receiving areas exposed within the small and large diameter portions of said bore and subdividing said bore into a first chamber in communication with said inlet port and a second chamber in the form of an annular chamber normally isolated from said outlet port and communicated with said first chamber therethrough;

a first spring for loading said sleeve member in the direction

toward a usual position in which said second chamber is isolated from said outlet port;

a differential piston axially reciprocable within said sleeve member to provide a third chamber in open communication with said outlet port, said piston having small and large effective piston areas whereby opposing displacement forces may be provided on said piston respectively in the directions toward and away from said outlet port;

valve means including a valve seat provided within said sleeve member and a valve part of said piston cooperable with said valve seat for controlling intercommunication between said first and third chambers in dependence upon the displaced position of said piston; and

a second spring for loading said piston in the direction toward a usual position in which said valve means opens to permit fluid communication between said first and third chambers.

4,180,295

BRAKE PROPORTIONING MEANS

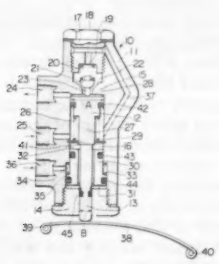
Hiroshi Takeshita, Chiryu; Hiroyuki Kondo, Toyokawa; Takaaki Ohta, Okazaki; Yoshihisa Nomura, and Tomoyuki Nogami, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 23, 1978, Ser. No. 889,214

Claims priority, application Japan, Mar. 24, 1977, 52-32491

Int. Cl.[2] B60T *8/22*

U.S. Cl. 303—22 R **8 Claims**



1. Device for use on vehicles equipped with hydraulic brakes and dual master cylinders for separate hydraulic circuits to front and rear brakes, the device adapted to vary the braking force on the vehicle wheels depending upon the vehicle load as well as shifting of weight of the vehicle, characterized by the following combination:

(a) a pressure varying device secured to one of at least two vehicle masses separated by means of a suspension system, the pressure varying device comprising a cylinder and a piston movable therein which subdivides the cylinder inside into two chambers, toward which it exposes faces differing in area, spring means biasing the piston in the cylinder, a normally open valve controlling intercommunication of the said two chambers which are connected to one of the master cylinders and the braking circuit to the rear brake, respectively, and said valve intercepting the said intercommunication upon a predetermined value of the pressure transmitted by said one of the master cylinders after the piston which is spring-biased by the spring means has started its movement,

(b) the pressure varying device having associated therewith means comprising a resilient member interposed between the piston and the other one of the above mentioned vehicle masses separated by the suspension means, the said piston having a rod extending within one of the chambers therebeyond and engaging said resilient member so as to be subjected to a thrust from said resilient member, the resilient member forming at least a part of the said spring means biasing the piston of the pressure varying device, so that the effect of the pressure varying device is at least partially controlled by the position of the two vehicles masses separated by the suspension system and hence by the vehicle load,

(c) the pressure varying device further having therewith associated means for blockading the said starting of the piston in response to failure of the front brakes so that the said interception by the said valve is prevented and unrestrained passage of fluid through the pressure varying device is thereafter permitted for compensating the failure of the front brakes, said blockading means comprising a locking member to lock the piston in a position prior to the said starting and said locking member comprising a sleeve surrounding the rod and having opposed end faces each of which is exposed against the fluid pressure in the circuit to the rear wheel brakes and differing in area, thus forming a stepped external surface adapted to define in a slidably fitting cooperation with one of said two chambers an annular chamber connected to the circuit to the front brakes.

4,180,296

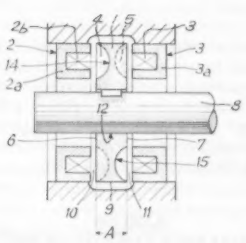
AXIAL ELECTROMAGNETIC BEARING FOR A SHAFT ROTATING AT HIGH SPEED

Helmut Habermann, Vernon, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Jan. 6, 1978, Ser. No. 867,381

Int. Cl.[2] F16C *39/00*

U.S. Cl. 308—10 **6 Claims**



1. An axial electromagnetic bearing for supporting the end of a shaft rotating at high speed comprising an armature in the form of a disc attached to the shaft and an annular fixed armature located, in relation to the former, a short distance therefrom to define a small axial air gap therebetween, the said fixed armature comprising excitation windings and a ferromagnetic core, and the bearing being characterized in that radial grooves are provided in the peripheral portion of the disc armature facing the fixed armature, the spacing of said radial grooves being effective to reduce eddy currents when said shaft is rotated at high speed.

4,180,297

SEALING GROMMET IN A REFRIGERATOR CABINET

Donald W. Abrams, Atlanta, Ga., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 22, 1977, Ser. No. 835,946

Int. Cl.[2] F25D *23/08;* H01B *17/58;* H02G *3/22*

U.S. Cl. 312—214 **8 Claims**

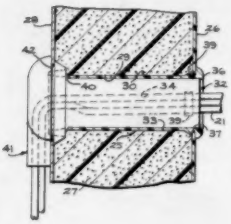
1. In combination, a refrigerator cabinet having inner and outer walls, insulation between the inner and outer walls, an opening in each of the inner and outer walls, the insulation having a passage to provide communication between the openings in the inner and outer walls, a grommet disposed in the passage in the insulation, said grommet comprising:

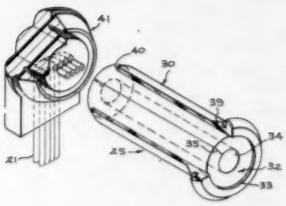
a longitudinal, hollow body of a relatively rigid material having a single longitudinal passage extending therethrough;

a core of a relatively flexible material disposed within said

longitudinal passage in said body for support by said body and in air sealing relation with said body, said core having a longitudinal passage extending therethrough;

each of said body and said core being slit longitudinally to enable said passage of said core to receive at least one article therein for passage therethrough;





mounting means secured to one end of said body and attaching said body to one of the inner and outer walls of the refrigerator cabinet in air sealing relation therewith;

and said core being in air sealing relation with the other of the inner and outer walls of the refrigerator cabinet to prevent any contact of the insultion with any article passing through said passage of said core.

4,180,298

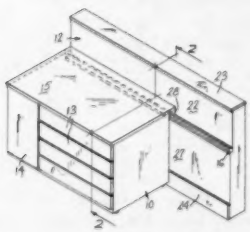
RELOCATABLE FURNITURE SYSTEM

Newton H. Borgerson, Jr., Anthony Ct., Bethany, Conn. 06525

Filed Apr. 10, 1978, Ser. No. 894,721

Int. Cl.[2] A47B *67/02*

U.S. Cl. 312—242 **11 Claims**



1. A relocatable furniture system comprising, at lease one piece of furniture, a wall mounted horizontal support rail, said rail extending from a wall and having elongated leading and trailing inclined surfaces, said surfaces defining a first ridge therebetween spaced from the wall, said piece of furniture having front and rear rollable support casters and having a rear extension toward the top thereof, a member having a depending ridge on said extension at a height which abuts said leading surface and which will depend behind said first ridge in contact with said trailing surface whereby said cabinet may be moved on its casters against said support rail and said member will ride up said inclined leading surface and said depending ridge will depend behind said first ridge so that the rear of said piece of furniture is releasably captured by said rail and supported thereon with the rear casters above the floor, said front casters being adjustable in height to level said piece of furniture.

4,180,299

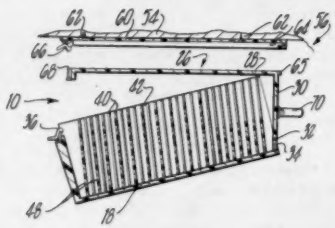
CARRIER

Lawrence E. Tolerson, 3319 Barth, Flint, Mich. 48504

Filed Apr. 17, 1978, Ser. No. 896,972

Int. Cl.[2] A47B *81/06;* **B65D** *85/672*

U.S. Cl. 312—242 **20 Claims**



1. A carrier for removable mounting within a vehicle, said vehicle having a passenger compartment, said carrier comprising:

a housing, said housing being open on the top;

said housing defining a compartment accessible through the open top of said housing;

means for pivotally mounting said housing to the vehicle and within the passenger compartment, said housing being pivotal between a first position in which the top of the housing and said housing compartment is openly accessible to the interior of the vehicle compartment and a second position in which the top of the housing is closed so that said housing compartment is inaccessible to the interior of the vehicle compartment; and

means for detachably securing said housing to the vehicle, wherein said pivotal means further comprises a lid pivotally connected to said housing about a pivotal axis fixed with respect to said housing and said lid, and extending laterally of said housing, and

wherein said means for securing said housing to the vehicle comprises means for securing the lid to the vehicle passenger compartment,

wherein when said lid is secured to the vehicle passenger compartment, said housing is pivotable between a position in which the top of said housing is openly accessible to the interior of the vehicle passenger compartment and a position in which the top of said housing is closed by said lid so that it is inaccessible to the interior of the vehicle passenger compartment.

4,180,300

DOUBLE RING AND RADIAL CONDUCTOR ASSEMBLY FOR LARGE HOLLOW SHAFTS

Emil M. Fort, Murrysville, Pa., and Jacques E. Albaric, Nimes, France, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1977, Ser. No. 857,480

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—5 R **6 Claims**

1. An elastic fluid turbine apparatus comprising:

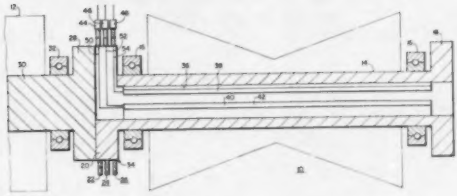
a hollow, rotatable shaft having an exterior and an interior surface with a radial opening connecting them;

a first conductive ring insulatively secured to said shaft's exterior surface through an interference fit therewith, said ring having a radial opening therethrough;

an electrically conductive lead extending through said ring's opening and through the shaft's opening, said conductor lead being insulated from the shaft;

means for electrically connecting said electrically conductive lead and said first ring; and

a second conductive ring attached to the outer periphery of said first ring, said attachment being through an interfer-



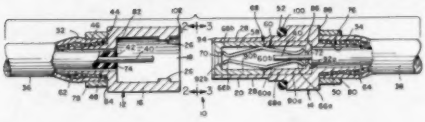
ence fit, said second ring having an electrical contact surface for receiving electrical energy supplied thereto and for conducting it through said first ring and conductive lead to said shaft's interior.

4,180,301

COAXIAL CABLE CONNECTOR

Harold G. Hutter, Brookfield, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 15, 1978, Ser. No. 886,854
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—90 C **23 Claims**



1. A connector for joining ends of a pair of cables comprising:

first and second connector members each having a mating end, said mating end of said first connector member having an opening to receive said mating end of said second connector member, said opening being defined by a generally cylindrical inner surface portion of said first connector member and said mating end of said second connector member being defined by a generally cylindrical outer surface portion;

means associated with said mating ends of said first and second connector members for orienting said connector members for mating engagement, said orienting means including a shoulder located on said inner surface portion of said first connector member and a longitudinally extending circumferential interruption located on said outer surface portion of said second connector member;

means associated with said mating ends of said first and second connector members for securing said connector members in locked engagement, said securing means including said shoulder on said inner surface of said first connector member and an annularly extending circumferential groove in said outer surface portion of said second connector member; and

means associated with said mating end of one of said connector members providing an environmental seal, said sealing means including a resilient retaining member resisting forces tending to move said connector members out of locked engagement;

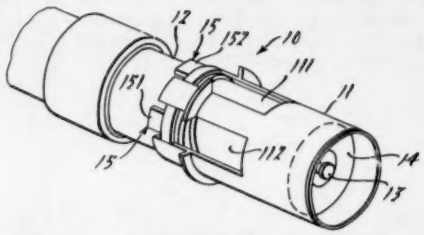
said circumferential interruption providing an entryway for said shoulder leading to said circumferential groove to permit locked engagement of said connector members with said shoulder disposed in said circumferential groove following mating engagement of said shoulder with said circumferential interruption.

4,180,302

CONNECTOR PLUG FOR VEHICLE ELECTRICAL TESTER

Thomas C. Gordon, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 18, 1978, Ser. No. 970,787
Int. Cl.[2] H01R *19/18;* **G01R** *31/02*
U.S. Cl. 339—143 T **7 Claims**



1. A connector plug for connecting a test apparatus used for testing a vehicle electrical system to the socket of a cigar lighter of a vehicle, said connector plug comprising:

a first contact adapted for connecting a signal processing component to the vehicle, said first contact being adapted to contact a portion of the cigar lighter socket carrying a positive battery voltage;

a second contact, spaced from said first contact adapted for connecting a power supply means for the test apparatus to the portion of the cigar lighter socket carrying a positive battery voltage, said first and second contacts being connected to substantially the same electrical point;

a static shield means relatively movable with respect to said first contact and biased to extend beyond said first contact so as to strike the cigar lighter socket before said first contact strikes the cigar lighter socket when inserting said connector plug into said cigar lighter socket so as to discharge static electricity from the test apparatus; and

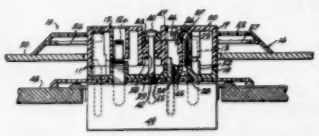
a ground terminal for completing the circuit of said first and second contacts, and adapted to be connected to ground potential of the vehicle when said connector plug is connected to the cigar lighter socket.

4,180,303

PLUG-IN ELECTRICAL RECEPTACLE EXTENDER

Arnold Damsky, 821 83rd St., Miami Beach, Fla. 33141

Division of Ser. No. 798,771, May 20, 1977, Pat. No. 4,090,769.
This application May 18, 1978, Ser. No. 907,204
Int. Cl.[2] H01R *13/20, 13/46*
U.S. Cl. 339—166 R **2 Claims**



1. In a plug-in electrical receptacle extender for use in association with an existing electrical receptacle having an electrically insulating housing, a plurality of contact prong receiving openings in the front surface of the housing and a cover plate of electrically insulating material; wherein said extender comprises an electrically insulating housing member having in the face thereof a plurality of contact-prong-receiving openings having the same relative disposition as the contact prong openings in the existing electrical receptacle, a plurality of electrical plug contactors behind said contactor openings projecting outwardly of said housing for plug-in reception in the original electrical receptacle, a cover plate for said receptacle extender,

and through openings in said extender cover plate and housing member for permitting the passage therethrough of cover plate attachment screw means adapted to be received in the cover plate screw receiving opening in the original electrical receptacle whereby said outer cover plate is retained in covering relation with respect to the electrical receptacle extender; the improvement comprising at least one spacer element having an aperture therethrough said spacer element being adapted to be positioned between said extender cover plate and said housing member with the aperture of said spacer element being juxtaposed with the through openings in said extender cover plate and said housing member.

4,180,304

DISSEMBLABLE MULTI-PART ELECTRICAL CONNECTOR

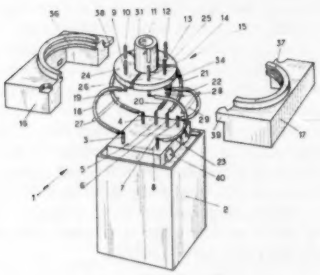
Gerard Lerude, Poitiers, France, assignor to La Telemecanique Electrique, France

Filed Dec. 2, 1977, Ser. No. 856,933

Claims priority, application France, Dec. 3, 1976, 76 36636

Int. Cl.[2] H01R *13/46, 33/80*

U.S. Cl. 339—196 M **4 Claims**



1. A connecting device for an electrical appliance, said electrical appliance having a body provided with electrical connecting pieces, the said connecting device comprising:

(a) an insulating plug provided with output terminals which are spaced regularly and each of which includes a connecting extremity

(b) flexible electric conductors connecting the connecting pieces and the connecting extremities of the output terminals, and

(c) connecting devices for securing the plug to the said body, wherein:

(i) said plug is constituted by a plurality of elements of insulating material

(ii) each said plug element carries a plurality of output terminals

(iii) the flexible electrical conductors attached to two neighboring connecting extremities of respective output terminals carried by the same plug element run parallel to each other up to the said body and have such a length and such a flexibility that the plug elements can be moved into a first position in which said plug elements are separated out and lie flat substantially in the same plane as the flexible conductors, and into a second position in which said flexible electrical conductors are folded and the plug elements are disposed in contact with each other in a further plane and are held together by said connecting devices.

4,180,305

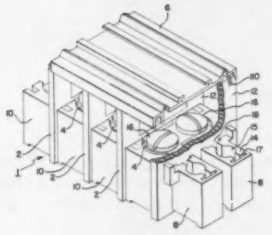
SECTIONAL ELECTRICAL TERMINAL BLOCK

George Ustin, Croton-on-Hudson, and Andrew P. Soltis, Yonkers, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,734

Int. Cl.[2] H01R *9/10, 9/16*

U.S. Cl. 339—198 H **21 Claims**



1. A sectional terminal block comprising a plurality of sections and at least one contact element having two arms, wherein

a first section includes a longitudinally projecting portion having a pair of contact arm slots for receiving the arms of said contact element inserted transversely to said portion,

a second section includes recess means for receiving said projecting portion and positioning said sections transversely with respect to each other, and a contact slot for receiving one arm of said contact element inserted transversely to said portion, and

said contact element is arranged so that said one arm passes through the slot in the second section and is locked in one slot in said projecting portion and the other arm is locked in the other slot of said projecting portion to lock said sections longitudinally with respect to each other.

4,180,306

METHOD OF AND DEVICE FOR SCANNING THERMOGRAPHIC PICTURES

Jens Dührkoop, Neckargemund, and Günter Pusch, Neckargemund-Dilsberg, both of Fed. Rep. of Germany, assignors to Industrie Automation GmbH & Co., Heidelberg, Fed. Rep. of Germany

Filed Aug. 9, 1976, Ser. No. 712,788

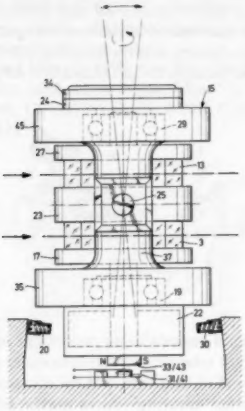
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535394

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.4 **8 Claims**

1. A method of scanning thermographic pictures by means of a scanning device comprising a rotating polygonal prism which includes the steps of scanning the respective picture in a first direction by rotating said polygonal prism of the scanning device about its axis of rotation, and scanning said respective picture in a second direction perpendicular to said first direction by oscillating said axis of rotation about an axis ex-

tending perpendicular to said axis of rotation and in parallel to the polygon surfaces being momentarily in the beam path



when said surfaces have assumed a position in which the optical axis impinges at right angles on said surfaces.

4,180,307

TWO-DIMENSIONAL SCANNING APPARATUS WITH CONSTANT SPEED SCAN

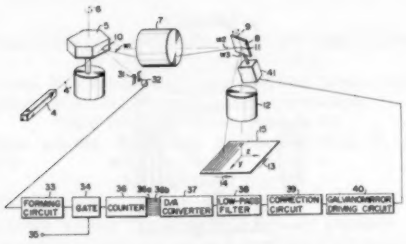
Masamichi Tateoka; Takao Tsuji, both of Kawasaki; Setsuo Minami; Kazuya Matsumoto, both of Yokohama; Naoto Kawamura, Inagi, and Kazuo Minoura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1978, Ser. No. 931,927

Claims priority, application Japan, Aug. 12, 1977, 52/96719

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.5 **4 Claims**



1. A two-dimensional scanning optical system comprising:

a first deflector for deflecting a light beam in a determined direction;

a second deflector for deflecting a light beam received from said first deflector, said deflection being performed in a plane perpendicular to the deflecting plane of said first deflector;

a scanning plane subjected to a two-dimensional scanning by a light beam emergent from said second deflector;

an afocal optical system provided between said first and second deflectors; and

an imaging lens system provided between said second deflector and said scanning plane;

wherein a first optical system composed of said first deflector, afocal optical system and imaging lens system comprising an optical means for causing the light beam to displace at a constant speed in a first direction on said scanning plane; and

a second optical system composed of said second deflector and said imaging lens comprising an optical means for causing the light beam to displace at a constant speed in a second direction orthogonal to said first direction on said scanning plane.

4,180,308

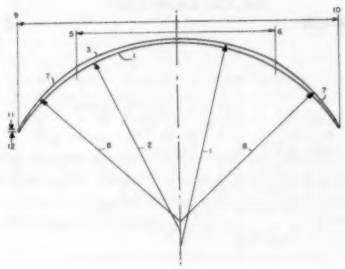
CONTACT LENS

William L. Mancini, Framingham; Donald R. Korb, Boston, and Miguel F. Refojo, Lexington, all of Mass., assignors to Syntex (USA) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 685,996, May 13, 1976, Pat. No. 4,056,496, which is a continuation-in-part of Ser. No. 451,906, Mar. 18, 1974, Pat. No. 3,957,362, which is a continuation-in-part of Ser. No. 294,019, Oct. 2, 1972, abandoned. This application Oct. 28, 1976, Ser. No. 736,555

Int. Cl.[2] G02C *7/04*; C08L *00/00*

U.S. Cl. 351—160 H **25 Claims**



1. A soft minus prescription hydrogel contact lens, said lens having a maximum cross-sectional thickness at any point not exceeding 0.15 mm and being of a hydrogel sufficiently rigid so as not to irreversibly deform during blinking and sufficiently flexible so as to conform to the curvature of the eye.

4,180,309

FOCAL POINT DETECTING DEVICE FOR SLR CAMERA

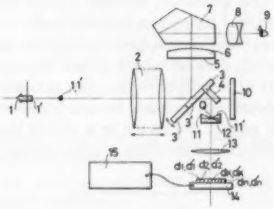
Katsuhiko Miyata, Omiya; Seijiro Tokutomi, Tokyo, and Kazuo Nakamura, Asaki, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,718

Claims priority, application Japan, May 22, 1976, 51-59480

Int. Cl.[2] G03B *13/18*

U.S. Cl. 354—25 **16 Claims**



1. In a single lens reflex camera including a pair of oppositely inclined wedge prisms, a two row array of photoelectric conversion elements disposed optically beyond the prisms, and means for directing light rays from a photographic object onto the prisms, whereby the prisms split the object image into two halves whose relative lateral displacement on the array element rows and level of contrast is a function of the degree of correct image focus, means for detecting the correct image focus characterized by:

(a) means for differentially comparing the outputs of paired, laterally offset elements in the two array rows, said paired elements being laterally offset by equal amounts in two opposite directions parallel to the array rows,

(b) means for summing the results of said differential comparisons, and

(c) means for detecting when said summed results exceed a predetermined threshold level indicative of correct image focus.

4,180,310

PHOTOMETRIC CIRCUIT

Masahiro Kawasaki, and Yoshio Sawada, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

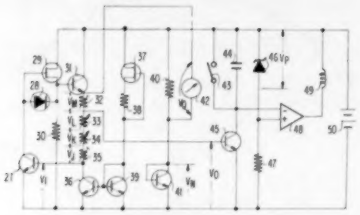
Continuation of Ser. No. 679,587, Apr. 23, 1976, Pat. No. 4,106,035. This application Mar. 17, 1978, Ser. No. 887,914

Claims priority, application Japan, Apr. 25, 1975, 50-50470

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—24 **3 Claims**



1. A photometric circuit for electronically determining proper exposure time based on scene brightness, film sensitivity and aperture settings, said circuit being of the type having a photoelectric transducer for developing a current dependent upon scene brightness, a first transistor having its collector connected to said photoelectric transducer and its base connected to its collector by a high input impedance collector-to-base feedback circuit for developing a base-to-emitter voltage related to the apex indication value B_v of the brightness B of the scene, a pair of variable resistors for setting the film speed and aperture values into the circuit, respectively, and a second transistor for developing an exposure control current at its collector in dependance upon the voltage applied between its base and emitter, the improvement comprising,

said variable resistors being connected in series with each other and in the feedback circuit between collector and base of the first transistor, constant current source means connected to said series connection of said variable resistors for providing a constant current to said variable resistors having a value which causes the voltage across said resistors to be related to the apex indication values S_v and A_v, respectively, and said second transistor having its base-emitter circuit connected in a circuit loop with said variable resistors and said base-emitter circuit of said first transistor.

4,180,311

INTERLOCKING DEVICE FOR INDICATION IN THE FINDER OF A SINGLE-LENS REFLEX CAMERA

Fumio Urano, Omiya, and Akihiro Arai, Urawa, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1978, Ser. No. 906,805

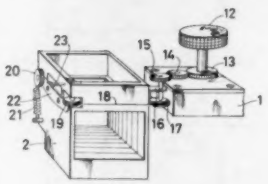
Claims priority, application Japan, May 31, 1977, 52-70195[u]

Int. Cl.[2] G03B *17/20, 19/12*

U.S. Cl. 354—53 **3 Claims**

1. In a camera having removable optical components and an indicating device mounted on a first camera component and extending into the optical path of the camera viewfinder, said indication device controlled by a first element which is mounted on a second camera component and rotatable by the camera operator, the improvement comprising:

a second rotatable element operatively coupled to said indication device and mounted on said first camera component, said second rotatable element being coupled to said first rotatable element and transmitting the rotation of said first rotatable element to said indication device when said



first and second camera components are assembled, said first and second rotatable elements being easily disengagable for removal of said first camera component; and

locking means for securing the rotatable position of said second rotatable element to prevent free rotation thereof when said first and second rotatable elements are disengaged.

4,180,312

PHOTOGRAPHIC CAMERA WITH THROUGH THE LENS EXPOSURE METER

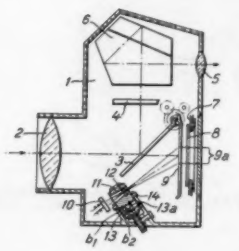
Ewald Schmidt, Braunfels, and Willi Wiessner, Wetzlar, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,608

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705300

Int. Cl.[2] G03B *7/00*

U.S. Cl. 354—59 **13 Claims**



1. In a photographic camera having a through the lens exposure metering system with an exposure meter comprising a silicon-, or gallium-arsenide-phosphorus-diode, light passing through an objective of said system, said diode mounted in a space behind said objective and receiving said light, and having means for switching said exposure metering system between an integrating measurement and a selective measurement, the improvement comprising:

said integrating measurement comprising a first optical system guiding said light from substantially the entire object space onto said diode, said selective measurement comprising a second optical system, guiding said light from a restricted sector of said object space onto said diode, means for alternatively bringing said first and second optical systems into said light and in front of said diode, and a light intensity attenuator operably connected with said first optical system, said attenuator movable into said light together with said first optical system, said attenuator serving to achieve equal illumination intensities on said

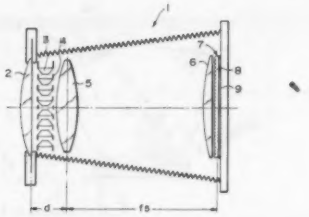
diode for both said integrating and selective measurements.

4,180,313

STEREOSCOPIC CAMERA

Masafumi Inuiya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 7, 1978, Ser. No. 884,354
Claims priority, application Japan, Mar. 11, 1977, 52-26755
Int. Cl.[2] G03B *35/00*; G02B *17/00*
U.S. Cl. 354—112 **4 Claims**



1. A stereoscopic camera for taking a picture of a three dimensional object on a photosensitive material having a lenticular film thereon, said camera comprising a positive objective having a focal length of 1.0 to 4.0 m, an image inverting optical means located immediately behind the positive objective for inverting an image with respect to right and left, a taking lens located immediately behind the image inverting optical means for focusing an image of an object of the camera, means for supporting a photosensitive material at a position separated from said taking lens therebehind by a distance equal to the focal length of the taking lens and a field lens located immediately in front of said photosensitive material supporting means so that the field lens is located in front of the photosensitive material, said field lens having a focal length equal to or longer than that of said taking lens.

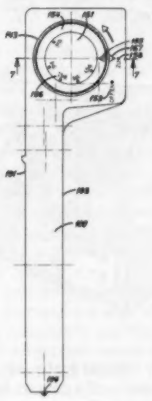
4,180,314

APPARATUS FOR VARYING PICTURE SIZE BEFORE OR AFTER FILM ADVANCE

Carl Koch, Im Santenbuhl, Stetten, and Rolf Meyer, Hohlenbaumstrasse 81, Schaffhausen, both of Switzerland

Filed Feb. 2, 1978, Ser. No. 874,577
Claims priority, application Switzerland, Feb. 7, 1977, 1442/77
Int. Cl.[2] G03B *1/42*
U.S. Cl. 354—159 **21 Claims**

1. Device for use in making photographic exposures on a strip-shaped light-sensitive material comprising a housing having a light-path opening, a picture area limiting frame enclosing the light-path opening, means for guiding the strip-shaped light-sensitive material behind the picture area limiting the frame and the light-path opening, a transport arrangement for the forward transport of the strip-shaped material in steps in its longitudinal direction, at least one adjustable mask for covering portions of the light-path opening thereby forming a picture window smaller than the picture area limiting frame, the portions of the light-path opening which can be covered by the mask adjoining opposite edges of the light-path opening that are at right angles to the longitudinal direction of the strip-shaped material so that a first edge of the picture window as well as a second edge of the picture window as seen in reference to the forward transport direction of the strip-shaped material are alterable in position by displacement of the mask, control means for the automatic limitation of the steps of forward transport caused by the transport arrangement of the strip-shaped material in adaptation to the size of the picture window defined by the mask, means for selecting a desired picture window and unidirectional linking means interconnected between the means for selecting the picture window and the transport arrangement for the strip-shaped material such that each adjustment of the means for selecting the picture window, which calls for a position change of the second edge of the picture window in the forward transport direction of the strip-shaped material automatically produces a a forward correction transport of the strip-shaped material at least equal to said position change.

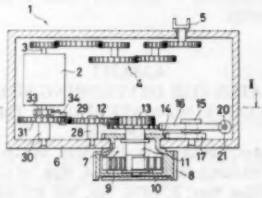


4,180,315

AUTOMATIC FILM WINDING APPARATUS FOR USE WITH CAMERAS

Shiyozo Nozawa; Saburo Hokari, both of Kawasaki, and Shigeru Yamaga, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 27, 1978, Ser. No. 919,628
Claims priority, application Japan, Jun. 28, 1977, 52-77009
Int. Cl.[2] G03B *1/18*
U.S. Cl. 354—170 **8 Claims**



1. An automatic film winding apparatus for use with cameras, said apparatus comprising:

main driving means comprising an electric motor and an output shaft therefor;

sub-driving means comprising a spring motor;

a connecting member which is to be connected to a film winding mechanism of a camera and which is connected to said output shaft;

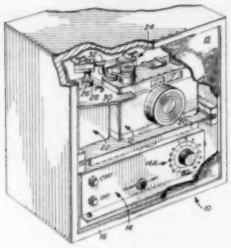
connecting means for connecting said sub-driving means to said main driving means, said connecting means comprising a one-way rotation transmission mechanism which allows transmission of rotation only from said sub-driving means to said output shaft; and

switching means for selectively actuating said connecting means to transmit power from said sub-driving means to said output shaft to drive said connecting member.

4,180,316
LOW NOISE AUTOMATIC CAMERA ADVANCE MECHANISM

Louis D. Della-Calce, Phoenix, Ariz., assignor to Crimeye Inc., Phoenix, Ariz.

Filed May 8, 1978, Ser. No. 903,802
Int. Cl.[2] G03B *1/12*
U.S. Cl. 354—173 10 Claims



1. A mechanism for automatically advancing film and depressing an exposure button of a camera having a film winding lever and exposure button collar means attached to a surface of said camera, said exposure button extending through said exposure button collar means, said mechanism comprising in combination:

a. motor means mounted in fixed relationship to said camera for rotating a shaft;

b. first means, rotatably connected to said exposure button collar means, for engaging said film winding lever during rotation of said first means in a counterclockwise direction with respect to said surface through an angle sufficient to advance the film of said camera, said first means then rotating in a direction clockwise with respect to said suface to an initial position, causing said film winding lever to return to an initial position, said clockwise and said counterclockwise rotation occurring in response to and at a rate determined by said rotation of said shaft;

c. Second means responsive to said rotation of said shaft for engaging said first means to produce said counterclockwise and clockwise rotation of said first means; and

d. exposure button depressing means coupled to said second means for depressing said exposure button during said clockwise rotation of said first means in response to said second means.

4,180,317
APPARATUS FOR DEVELOPING SHEETS OF DIAZOTYPE COPYING MATERIAL BY THE SEMI-DRY PROCESS

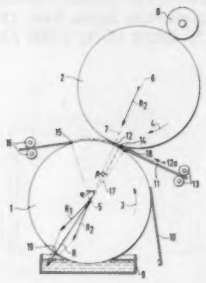
Herbert Schroter, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1978, Ser. No. 957,446
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749627
Int. Cl.[2] G03D *5/06*
U.S. Cl. 354—318 4 Claims

1. In an apparatus for developing sheets of diazotype copying material by the semi-dry process comprising an arrangement of at least two rolls, each of which is rotatable about an axis, means biasing two rolls together with a gap between them through which said sheets of diazotype material to be developed are adapted to pass, means for exerting an additional force upon at least one of said two rolls, and means for applying and spreading liquid developer on one of said two rolls,

the improvement comprising that said means for exerting an additional force transfers a plane of deflection of one of said rolls to a position outside of a principal plane in which said roll axes are located in a manner such that a first line of intersection between said plane of deflection and the shell of said one roll, starting from which line of intersection the deflection is directed toward said roll axis, extends in front of said gap, when viewed in the rotational direction of said roll,

first guide means adapted to bring said sheets of diazotype copying material into contact with said roll at a first transition line between said first line of intersection and said gap,

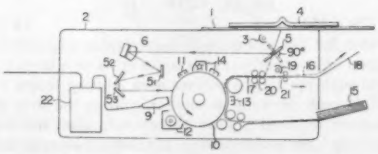


and second guide means adapted to lift said sheets off of said roll behind said gap at a second transition line located before a second line of intersection between said plane of deflection and said shell of said roll, starting from which second line of intersection the deflection is directed away from said roll axis.

4,180,318
MULTI-COPYING METHOD AND MULTI-COPYING APPARATUS

Fuyuhiko Matsumoto, Tokyo, and Toshiyuki Inokuchi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd.

Filed May 26, 1978, Ser. No. 909,809
Claims priority, application Japan, May 31, 1977, 52/62755
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—11 12 Claims



1. An electrophotographic multi-copying apparatus comprising, in combination, a recording material operable to have an image to be copied recorded thereon, an optical system operable to project said image onto said recording material, a mirror rotatable between first and second positions and, in the first position, transmitting an image of an original document to be copied to said optical system and, in the second position, transmitting an image of each copy made by said electrophotographic multi-copying apparatus to said optical system, before each copy is discharged from said electrophotographic multi-copying apparatus, said mirror continuously maintaining said second position after the first copy is made, until a desired number of identical copies are made from the respective preceding copies.

4,180,319
COPYING ARRANGEMENT

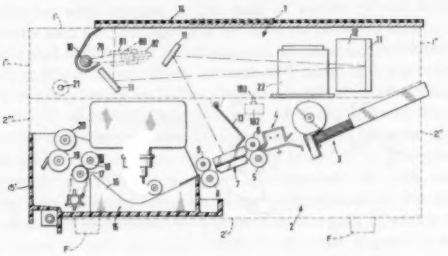
Heinrich Kaufmann, Stuttgart, and Kurt Moser, Gerlingen, both of Fed. Rep. of Germany, assignors to Fa. Develop KG, Dr. Eisgein & Co., Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 770,071

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606458

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **84 Claims**



80. A copying arrangement, which includes a housing means, a paper feeder means for feeding a sheet of copying paper upon which an image is to be transferred, a corona discharge means, an exposure station means associated with an optical system for transferring an image of an original arranged on an exposure carriage means, and a developing means arranged downstream of the exposure station means, characterized in that said housing means includes an upper housing section and a lower housing section, said lower housing section is open toward the top and accommodates at least the paper feeding means, the corona discharge means, the exposure station means and the developing means, the upper housing section accommodates at least the exposure carriage means and the optical system with said upper housing section being removable so as to uncover the entire flow path of the copying paper, and in that the corona discharge means includes a U-shaped corona housing means for accommodating wires connected to a voltage source, and a baffle means connected to ground arranged oppositely to an open side of said U-shaped corona housing means.

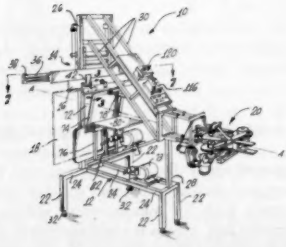
4,180,320
PHOTOGRAPHIC APPARATUS FOR USE IN MAKING PRINTING PLATES

John D. McCollough, Los Angeles, Calif., assignor to Delta Microfilm, Los Angeles, Calif.

Continuation-in-part of Ser. No. 798,123, May 18, 1977, Pat. No. 4,105,325. This application May 15, 1978, Ser. No. 906,121

Int. Cl.[2] G03B *27/44*

U.S. Cl. 355—54 **19 Claims**



1. An apparatus for use in making printing plates including a plurality of pages arranged in a predetermined format comprising:

a support;

hanger means for holding a sheet of photosensitive material;

track means for attaching said hanger means to said support while permitting horizontal and vertical movement thereof;

first transport means comprising a fluid-actuated cylinder for moving said hanger means along said track means a predetermined distance in a first direction upon actuation thereof;

second transport means comprising a fluid-actuated cylinder for moving said hanger means along said track means a predetermined distance in a second direction perpendicular to said first direction upon actuation thereof, whereby said hanger means and said sheet are capable of assuming at least four predetermined exposure positions in response to actuation of said first and second transport means;

control switch means for actuating said first and second transport means;

projection means for projecting a pre-recorded image from a transparency onto an exposure area of said sheet; and

positioning means for adjustably positioning said transparency with respect to said projection means to obtain proper registration of said image on said sheet.

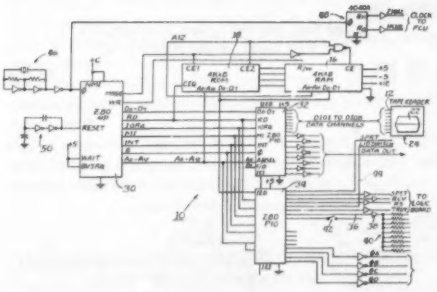
4,180,321
CONTROL SYSTEM FOR PHOTOGRAPHIC FILM PRINTER

Larry L. Langrehr, Chicago, and Charles J. Watson, Elgin, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 19, 1978, Ser. No. 916,621

Int. Cl.[2] G03B *27/78*

U.S. Cl. 355—83 **14 Claims**



1. A control unit for controlling the operation of a photographic printer comprising:

means including a single tape reading head for reading digital information punched on a tape;

means including a memory for storing information read by said reading head; and

control means coupled to said memory and to said reading means for rendering said reading means operative to read information from said tape and for rendering said memory operative to store said information, said control means including output means for reading the information stored in said memory and for providing an output signal for controlling the operation of said printer in response to the information stored in said memory.

4,180,322
INTERIOR MEASUREMENT OF ENCLOSED SPACES

Michel Farcinade, Geneva, Switzerland, assignor to Alcyon Equipment S.A., Renens, Switzerland

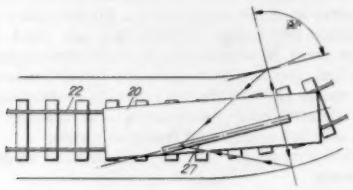
Filed May 1, 1978, Ser. No. 901,865

Int. Cl.[2] G01C *3/00;* **E01B** *35/02*

U.S. Cl. 356—1 **12 Claims**

1. A device for the measurement of interior profiles of an

elongated enclosed space in which, as said device is moved longitudinally along said enclosed space on a transport means, an image analyser is optically coupled to a light source via the profile to be measured in a manner to assure a predetermined proportionality between the dimensions of a projected image on the image analyser and those of the profiles to be measured, said light source being associated with a first means adapted to



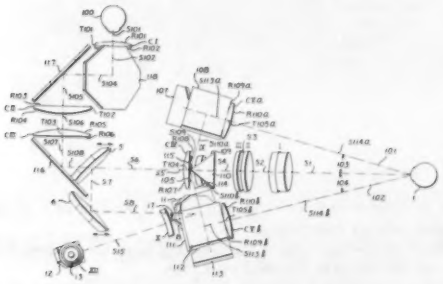
project a continuous collimated band of light toward said profile and second means in association with said first means adapted to change the horizontal angular position of said first means relative to said transport means whereby said collimated band maintains a substantially constant angle of incidence with said profile as said transport means moves along said elongated enclosed space.

4,180,323

ALIGNMENT SYSTEM AND OPHTHALMIC INSTRUMENT INCORPORATING THE SAME

Staffan B. Persson, Danielson, Conn., and Rato Buhler, Spencer, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sep. 30, 1977, Ser. No. 838,177
Int. Cl.² G01C *3/00*; A61B *3/02*
U.S. Cl. 356—3 **12 Claims**



1. An optical system having an alignment axis for observing an object and positioning a member in a chosen three-dimensional relationship to said object which comprises, in alignment and sequence along the alignment axis,

a stationary portion of said optical system having first and second lenses,

a movable portion of said optical system being movable with said member, said movable portion having a third lens, an image centering means, and a ranging means for observing the relationship of said member to a chosen spacing from said object, said centering means being constructed for observing the location of said member relative to said object in a plane containing the remaining two dimensions, and said second and third lenses cooperating to provide a zone of parallel light therebetween

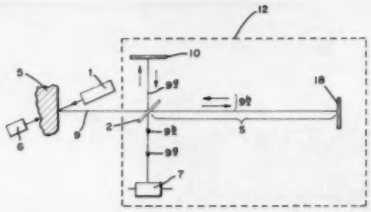
whereby an observer's head may remain stationary while observing movement of an image of the member.

4,180,324

METHOD AND APPARATUS FOR MEASURING DEFORMATION OF A WORKPIECE SURFACE RESPONSIVE TO ULTRASONIC ENERGY

Erik Primbsch, Cologne, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Oct. 4, 1977, Ser. No. 839,168
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709686
Int. Cl.² G01B *9/02*
U.S. Cl. 356—35.5 **2 Claims**



1. The method of sensing by optical interference the deformation of a workpiece surface resulting from acoustic energy in the workpiece comprising:

applying wave energy to a workpiece for causing surface deformation of such workpiece;

transmitting a coherent beam of light from a multimode laser upon the surface of the workpiece for sensing such deformation;

splitting said beam after reflection at said workpiece surface into a measuring beam portion and a reference beam portion;

transmitting said measuring beam portion to photoelectric sensing means, and

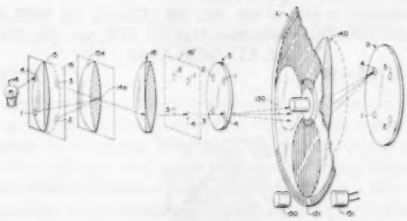
transmitting said reference beam portion over a delay path and thereafter bringing said reference beam to coincidence with said measuring beam portion at said photoelectric means, said delay path being dimensioned to cause its optical length to be a multiple integer of the optical length of the resonator of said laser.

4,180,325

LENS METER WITH AUTOMATED READOUT

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Jul. 5, 1977, Ser. No. 813,211
Int. Cl.² G01B *9/00*
U.S. Cl. 356—127 **38 Claims**



1. In the combination of a suspect optical system for measurement of deflection, at least one light source emanating at least three spaced apart discrete beams passed to said suspect optical system and deflected by said suspect optical system to a deviated beam path for measurement within a preselected area of excursion; and, means for measurement of said deviated path, the improvement in said means for measurement of said deviated path comprising: a moving boundary locus placed in a known plane at a preselected distance from said suspect

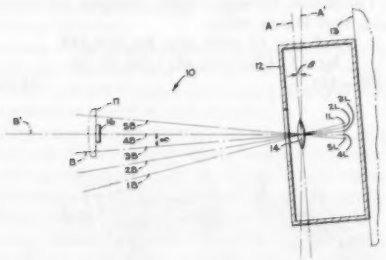
optical system; said moving boundary locus arranged for sweeping movement along a predetermined path within said known plane, said boundary locus including a first portion, a second portion and at least two boundaries therebetween of distinctly different shape with each of said boundaries sweeping at differing angularities with respect to the predetermined path of said moving boundary locus to provide a single unambiguous point of boundary intersection; means for sweeping said moving boundary locus along said predetermined path producing occultation of each said beam by said boundaries; one of said portions including equal intervals between said boundaries with respect to the path of sweep of said locus whereby said portion occupies the interval between said light source and detector for equal interval of sweeping movement at all positions of excursion of each said beam and the other portion of said locus including changing intervals between said boundaries with respect to the path of sweep of said locus whereby said other portion occupies the interval between said light source and detector for differing intervals of sweeping movement at differing positions of excursion of each said beam; said differing intervals being proportional to the displacement of said beams with respect to the path of sweep of said locus; at least one photosensitive detector aligned to receive each said beam; means for identification of each said beam from all other beams; means for measuring the position of said moving boundary locus when said detector detects produced occultation of each said beam at said boundaries of said moving boundary locus whereby at least one measurement of each of said moving boundaries of said moving boundary locus at the time of detector detection of occultation of each said beam measures the excursion of said beam due to deflection of said suspect optics.

4,180,326

ANGLE MEASURING APPARATUS

Andrew K. Chang, Malibu, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 19, 1977, Ser. No. 834,636
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—152 **18 Claims**



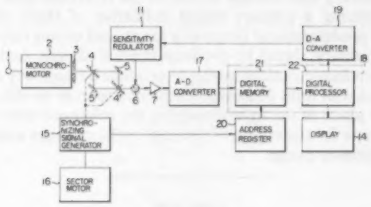
1. Angle measuring apparatus to determine the angle between reference axes on two members comprising a plurality of energy sources mounted on one of said members in fixed relation to the reference axis of said one member to cast beams in a predetermined diverging pattern from a defined plane toward the other member, a detector mounted on said other member in a predetermined position thereon relative to said reference axis thereof, the relative widths of the beams at the detector and the spacing thereof being such that at least two beams will strike the detector in a given position of the two members within the measuring range of the apparatus, and means to energize said sources sequentially until the beams from at least two of said sources strike said detector.

4,180,327

SPECTROPHOTOMETERS WITH DIGITAL PROCESSING

Yoshio Maeda; Koichi Matsumoto, and Seigo Kamitake, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1977, Ser. No. 843,790
Claims priority, application Japan, Oct. 22, 1976, 51-126201
Int. Cl.[2] G01J *3/42*
U.S. Cl. 356—320 **7 Claims**



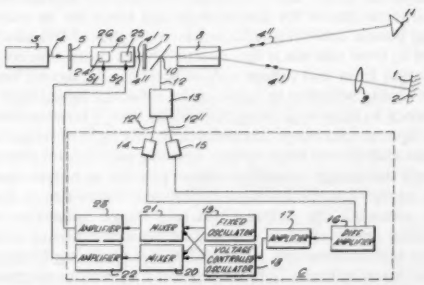
1. A spectrophotometer comprising:
a light source for emitting continuous spectra,
a photodetector for converting light impinging thereon into an electric signal, said photodetector being adapted to detect light from a sample disposed between said light source and said photodetector,
means disposed between said photodetector and said light source for producing two types of lights,
first monochromator means disposed between said light source and said photodetector for deriving monochromatic light ray,
an analog-to-digital converter for converting electric signal from said photodetector into a digital signal,
a digital memory for storing separately digital signals from said analog-to-digital converter corresponding, respectively, to said two types of light,
means for controlling so that signal value of one of said digital signals stored in said digital memory lies in a fixed range, and
a digital processor unit for reading out said two digital signals from said digital memory and arithmetically determining ratio between said digital signals.

4,180,328

INTERFEROMETER WHICH CORRECTS FOR SPURIOUS VIBRATIONS

Leslie E. Drain, Goring-on-Thames, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 708,385, Jul. 6, 1976, abandoned. This application Oct. 10, 1978, Ser. No. 949,567
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—349 **21 Claims**



1. A metrological interferometer for investigating vibrations of a structure, comprising a reference arm and a measuring arm

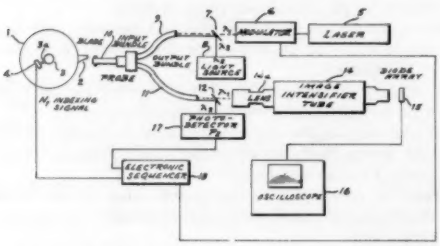
including a reflector adapted to form part of the structure, an electro-optical device adapted to produce from an input beam of monochromatic light two beams of light one of which has the same frequency and phase as the input beam and the other of which has a different frequency, the difference in frequency being governed by control signals, means for causing light of the orginal frequency to traverse one arm of the interferometer, means for causing light of the other frequency to traverse the other arm of the interferometer, a control loop comprising means for detecting cyclic changes in the optical path length of the measuring arm relative to that of the reference arm, means for producing a primary signal indicative of those changes within a predetermined frequency range, and means responsive to the primary signal to produce control signals such as to cause the electro-optical device to produce a frequency change in the beam of light of altered frequency such as to effectively vary the phase of the light traversing the reference arm so as to compensate for the effects of the said cyclic changes within the said frequency range.

4,180,329

SINGLE BLADE PROXIMITY PROBE

James R. Hildebrand, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1978, Ser. No. 889,795
Int. Cl.[2] G01B *11/14*
U.S. Cl. 356—375 **2 Claims**



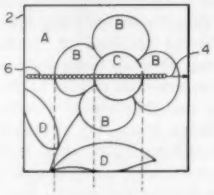
1. A single blade proximity system comprised of an operative engine rotor having an outer rim, a blade attached to said outer rim, said blade having a tip, an extending member attached to said rotor and rotating therewith to provide a voltage therefrom, an electrical proximity probe positioned to be activated by said rotating extension at each rotation to provide an indexing signal therefrom, a laser providing an output light of frequency λ_1, a modulator passing the output light of frequency λ_1, said modulator also receiving an input signal for the control thereof, a source of light of frequency λ_2, a first beam splitter receiving the modulated light of frequency λ_1, and said light of frequency λ_2 for mixing, an optical input bundle receiving the mixed lights of frequencies λ_1 and λ_2, an optical probe receiving the mixed lights of frequencies λ_1 and λ_2 from said optical input bundle for direction to said blade tip, an output optical bundle receiving reflected mixed lights of frequencies λ_1 and λ_2 from said blade tip, a second beam splitter receiving the output from said output optical bundle, said second beam splitter being selective to subtract the reflected mixed light of frequency λ_2 from λ_1 an image intensifier tube, a lens operating as an input to said image intensifier tube, the light of frequency λ_1 from said second beam splitter entering said lens for passage through said image intensifier tube to provide an output therefrom, an oscilloscope having a display face thereupon, a diode array receiving the output from said image intensifier and providing an electrical representative signal for display on the face of said oscilloscope, a photo detector receiving from said second beam splitter a light of frequency λ_2, and an electronic sequencer receiving two inputs, one of said inputs being said index signal and the second the output from said photo detector, the output of said electronic sequencer serving as said input to said modulator for triggering purposes to allow the output light of frequency λ_1 from said laser passage through said modulator.

4,180,330

METHOD OF AND A SYSTEM FOR COLOR SEPARATION

Hiroaki Kotera; Hiroyoshi Tsuchiya; Ryuzo Itabashi; Kunio Yoshida; Tsutomu Shibata; Yukifumi Tsuda; Yoshimitsu Kanno; Heijiro Hayami, and Haruko Sugita, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 18, 1977, Ser. No. 798,010
Claims priority, application Japan, May 19, 1976, 51/58369
Int. Cl.[2] G01J *3/46;* H04N *1/46*
U.S. Cl. 356—425 **8 Claims**



1. A method of color separation of colored patterns on a subject copy, which comprises the following steps:

scanning the subject copy by means of light beams;

detecting color borders each of which is between two consecutive different colored patterns, scanned by said light beams; and

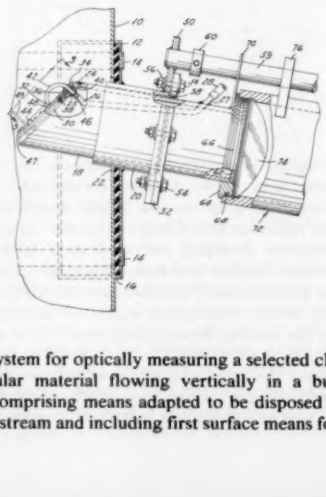
discriminating a color of a predetermined scanned portion following each of the detected color borders and determining the sensed color as a color between the detected and adjacent color borders.

4,180,331

METHOD AND APPARATUS FOR SAMPLING AND MEASURING A CHARACTERISTIC OF FLOWING GRANULAR MATERIAL

John W. Lundstrom, Glendora, Calif., assignor to Bindicator Company, Port Huron, Mich.

Filed Apr. 19, 1976, Ser. No. 678,149
Int. Cl.[2] G01N *21/48, 1/00, 21/26*
U.S. Cl. 356—445 **12 Claims**



5. A system for optically measuring a selected characteristic of granular material flowing vertically in a bulk material stream comprising means adapted to be disposed in said bulk material stream and including first surface means for providing

an optical window through which said characteristic may be measured and second surface means disposed downstream of said first surface means adjacent thereto at an angle projecting into said material stream and in a direction opposed to flow of material such that a deposit of flowing material accumulates and is held stationary by gravity against said second means covering said window while the remainder of the flowing material in said bulk stream continues to flow past said first and second surface means, and means disposed externally of said material stream for detecting said material characteristic by directing a light beam through said window onto said material deposit and measuring reflections therefrom.

4,180,332

DUST STOP

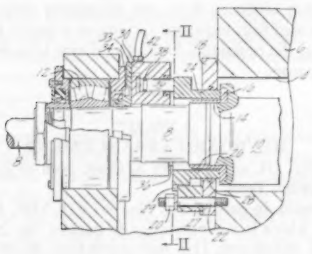
Ernest F. Twist, Leigh, England, assignor to USM Corporation, Farmington, Conn.

Filed Sep. 11, 1978, Ser. No. 941,228

Claims priority, application United Kingdom, Sep. 9, 1977, 37660/77

Int. Cl.² B01F *7/02*

U.S. Cl. 366—279 **5 Claims**



1. A mixing machine comprising:

a mixing chamber;

a mixing rotor mounted for rotation about an axis in said mixing chamber, said mixing rotor comprising a shaft which extends beyond said mixing chamber through an aperture in a wall of said chamber;

sealing means sealing between the wall of the mixing chamber and the rotor; said sealing means comprising a collar through which the shaft extends and which is mounted for movement axially of the shaft to engage a generally axially facing annular sealing surface of the rotor;

pressing means operable to urge the collar axially of the shaft to maintain the collar in contact with the sealing surface, the pressing means comprising a pressure block which has a plurality of piston chambers formed therein extending in directions generally axially of the rotor and spaced apart about the axis of rotation of the rotor, and a piston mounted in each of said piston chambers; and

means whereby the piston chambers are fillable with a pressurizable fluid, the pistons being arranged to urge the collar against the sealing surface of the rotor upon pressurization of any fluid in said piston chambers;

said pressure block only partially surrounding said shaft of said rotor permitting easy removal thereof from said rotor by raidally directed movement from said rotor.

4,180,333

BEARING FOR THE PRINTING HEAD OF A MATRIX PRINTER, AND PRINTING HEAD COMPRISING SUCH A BEARING

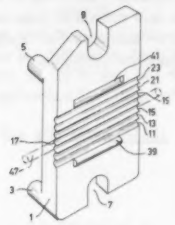
Uno K. E. Linder, Stockholm, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,793

Claims priority, application Sweden, Mar. 15, 1977, 7702881

Int. Cl.² B41J *3/12*

U.S. Cl. 400—124 **5 Claims**



1. A matrix printer assembly which comprises: a printing head, a plurality of slidable printing pins which are journalled in the printing head and whose printing ends are situated in the vicinity of each other on a straight line which extends transversely of the direction of a line to be printed, means for axially displacing each of said printing pins, and a bearing which can be inserted into the printing head and which comprises an individual, substantially straight guide channel for each printing pin, each printing pin being guided near the printing end thereof, said bearing having a first portion made of a first material and a second portion made of a second material which is harder than said first material,

wherein said first portion has at least two substantially straight insert channels formed therein parallel to the guide channels and also disposed on said straight line, viewed in a cross-section of the guide channels, and

said second portion includes at least two pin-shaped inserts manufactured of said second material and two insert channels in which said two pin-shaped inserts are respectively disposed, one of the pin-shaped inserts substantially adjoining one outer printing pin, and the other pin-shaped insert substantially adjoining the other outer printing pin, each pin-shaped insert not being connected to said means for axially displacing each of said printing pins.

4,180,334

DOT PRINTER

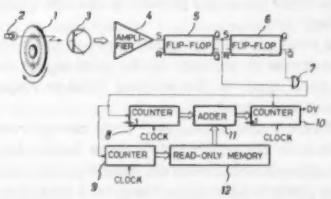
Akinori Watanabe, and Katsumasa Shinozuka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 773,832, Mar. 3, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,172

Claims priority, application Japan, Mar. 10, 1976, 51-24984

Int. Cl.² B41J *3/12*

U.S. Cl. 400—124 **9 Claims**



1. For a dot matrix type printer comprising a print head with print elements for accomplishing print functions by depositing

dots in columns selectively as the print head moves across a paper on which printing is effected, an improvement comprising

a control system for controlling the timing for said print elements to deposit successive columns of ink dots,

said control system comprising

means to measure the time of travel of said print elements between successive columns of dots to form a measured time,

means to store predetermined corrective time amounts corresponding to respective columns of ink dots,

means to combine said measured time and a respective one of said corrective amounts for controlling the time of activation of said print elements.

4,180,335

HIGH SPEED SERIAL PRINTER

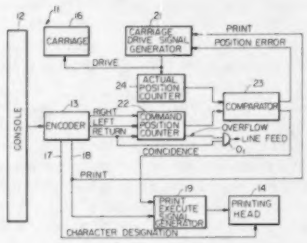
Kunihiro Yamada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,262

Claims priority, application Japan, Nov. 30, 1975, 50-143181

Int. Cl.[2] B41J *19/00, 5/30*

U.S. Cl. 400—320 **15 Claims**



1. A serial printer comprising:

a carriage supporting a printing head for printing characters;

drive means for positioning the printing head;

encoder means for producing print signal comprising character print instructions and drive signals comprising carriage space instructions;

first computing means for deriving a resultant drive signal from drive signals produced prior to any print signal;

second computing means for sensing an actual position of the printing head;

comparator means for comparing the actual position of the printing head with a command position of the printing head designated by the resultant drive signal and producing a coincidence signal when the actual position coincides with the command position and a position error signal when the actual position is unequal to the command position; and

control means for applying the position error signal to the drive means in response to the print signal and applying the print signal to the printing head in response to the coincidence signal;

whereby the printing head is directly moved from the actual position to the command position while skipping all of carriage spaces between the actual position and the command position and stopped to print a character only when the character print instructions are produced, and the printing head is physically stationary when the carriage space instructions only are produced.

4,180,336

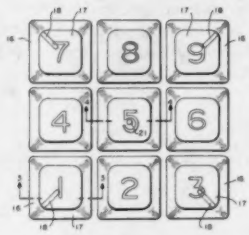
TOUCH CHECKING KEY TOPS FOR KEYBOARD

Alice Lonsdale, Berkeley, Calif., assignor to Safeway Stores, Incorporated, Oakland, Calif.

Filed Nov. 25, 1977, Ser. No. 854,626

Int. Cl.[2] B41J *5/08*

U.S. Cl. 400—491.3 **5 Claims**



1. In touch checking key tops for a keyboard for use on a cash register, a plurality of nine keys arranged in a generally square matrix with the digits **1** through **9** being assigned thereto, the keys being arranged in three spaced apart parallel rows, the keys also being arranged in three rows extending in a direction at substantially right angles to the spaced apart parallel three rows so that there are three keys forming each side of the square matrix with a key in the center and one key on each of the four corners of the square matrix, each of said four corner keys in the matrix having diagonally disposed raised portions formed on the keys and serving as tactile indicators to the operator, the center key of the matrix having a raised portion different from the diagonally disposed raised portions on said four keys and serving as a tactile indicator to the operator, the remaining keys of said nine keys being free of tactile indicators.

4,180,337

KEYBOARD ARRANGEMENT

Flem B. Otey, III, and Yoshiko S. Otey, both of 2230 Morena St., Nashville, Tenn. 37208

Continuation-in-part of Ser. No. 667,871, Mar. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 485,914, Jul. 5, 1974, abandoned. This application Oct. 26, 1977, Ser. No. 845,586

Int. Cl.[2] B41J *5/10*

U.S. Cl. 400—486 **1 Claim**

1. A keyboard arrangement comprising a keyboard in which each letter of the alphabet of a language is represented by an individual key, the keys being arranged in five primary columns or rows, with each primary row beginning with a vowel-representing key, and followed by consonant-representing keys in alphabetical order, the vowel-representing keys being arranged in alphabetical order in a column along one edge or side of the keyboard, a portion of the alphabet-representing keys being respectively employed to also represent numerals in a manner that locates zero on the o key and numeral one on the i key, the numeral keys zero, one, four and seven being in numerical order in the vowel column of keys, with the remain-

ing number-representing keys following the one, four and seven in numerical order.

4,180,338

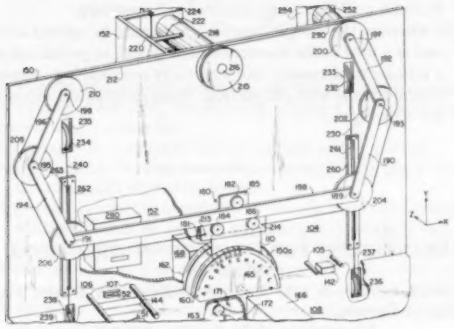
AUTOMATIC EMBOSSING SYSTEM WITH DOCUMENT TRANSFER

Richard J. LaManna, Whippany; Jacob H. Drillick, Hawthorne, both of N.J., and Michael D. Polad, Mendota, Minn., assignors to Data Card Corporation, Minneapolis, Minn.

Division of Ser. No. 720,071, Sep. 2, 1976, Pat. No. 4,088,216. This application Sep. 21, 1977, Ser. No. 835,406

Int. Cl.² B41J *11/50*

U.S. Cl. 400—582 **10 Claims**



1. A document transfer mechanism for transporting a document from an input means to an output means and to selected positions with respect to a reference position intermediate said input and output means, comprising

a main support,

a horizontal support rail,

first and second support arms each with two pivotally connected first and second portions, said arms being pivotally connected at first ends thereof to corresponding, opposite ends of said horizontal support rail and pivotally connected at the opposite, second ends thereof to said main support, said pivotal connections of said second ends to said main support being vertically aligned with, and spaced apart by the distance of the spacing of, the pivotal connections of said first ends to said horizontal support rail,

vertical transport means for selectively raising and lowering said horizontal support rail, and

horizontal transport means including a carriage mounted on said horizontal support rail for selective movement therealong, first and second pulleys connected to said horizontal support rail, at respective ones of said pivotal connections thereto, to respective ones of said pivotal connections of said first and second portions of each of said arms, and fifth and sixth pulleys connected to respective ones of said pivotal connections of said arms to said main support, a cable of fixed length engaging said pulleys, and means for engaging and selectively driving said cable thereby to move said carriage to selected positions along said horizontal support rail,

said carriage includes resilient engagement means, normally disposed to an engaged position,

means adjacent said input means for actuating said resilient engagement means to an opened disengaged position to receive a document therein from said input means and thereafter deactuating same to said engaged position for engaging said document received therein, and

means adjacent said output means to actuate said resilient engagement means to said disengaged position to release said engaged document, and

control means for controlling selective driving means of said horizontal and vertical transport means for lowering said horizontal support rail and moving said carriage to said input means to receive and engage a document, to transport said document to said reference position thereafter and to desired predetermined positions with respect to said reference position, and to transport said document from said reference position to said output means.

4,180,339

MECHANICAL PENCIL WITH AUTOMATIC LEAD FEED

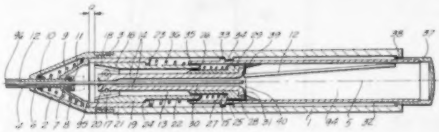
Otto Katz, Schwabach, Fed. Rep. of Germany, assignor to A. W. Faber-Castell, Stein bei Nürnberg, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,950

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729320

Int. Cl.² B43K *21/02*

U.S. Cl. 401—67 **24 Claims**



1. In a mechanical pencil with automatic lead feed, a combination comprising tubular housing means having opposite ends; a tubular lead magazine coaxially guided in said housing means moveable between a retracted and an extended position in which one end of the tubular lead magazine projects further beyond one end of said housing means than in said retracted position; a lead guide tube coaxially guided in said housing means in the region of the other end of the latter movable between a first and a second position in which one end of said tubular guide projects through a smaller distance beyond said other end of said housing means than in said first position; first spring means cooperating with said lead guide tube for biasing the latter to said first position; means for feeding a lead from said lead magazine into said lead guide tube and comprising tubular means coaxially guided in said housing means between two end positions and having at one end adjacent said other end of said housing means an inner conical guide face having a large diameter at said one end of said tubular means and tapering from said large diameter toward the axis of said tubular means, clamping means extending longitudinally through said tubular means and comprising a pair of resilient clamping arms having front ends adjacent said conical guide face and biased to move toward the latter and rolling elements carried by said front ends and engaging said conical guide face, said clamping means being movable relative to said tubular means between a rear clamping position in which said rolling elements are spaced from said one end of said tubular means to clampingly engage with clamping faces thereof a lead located therebetween and a forward releasing position, and second spring means between said tubular means and said clamping means and biasing the latter to said clamping position; third spring means between said housing means and said tubular lead magazine for biasing the latter to said extended position and to yieldably couple said tubular lead magazine to said tubular means, whereby during movement of said tubular lead magazine from said extended toward said retracted position, said tubular means is moved from one to its other end position; cooperating means on said tubular magazine and said clamping means for moving the latter together with said tubular means during movement of said tubular means to said other end position while said clamping means remain in said clamping position so as to feed a lead clamped therebetween toward said lead guide tube until said tubular means reaches its other end position, whereby during further movement of said tubular lead magazine to said retracted position said clamping means is moved relative to said tubular means so that said rolling elements move toward said large diameter of said conical guide

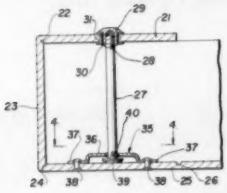
face causing thereby disengagement of said clamping faces from a lead therebetween; and entrainment means on said lead guide tube constructed to exert on a lead extending through said lead guide tube during movement relative to the tube into said housing means a greater friction force than during movement of the lead relative to the tube in the opposite direction.

4,180,340

BINDER POST CONNECTION

Billy Q. Cosby, Dalton, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Oct. 11, 1978, Ser. No. 950,471
Int. Cl.[2] B42F *13, 14*
U.S. Cl. 402—63 **7 Claims**



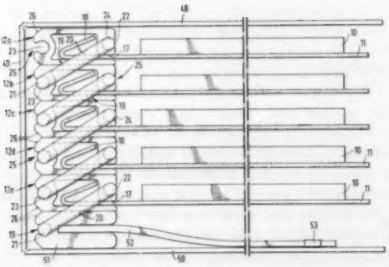
1. In a binder opposing binder sections adapted to receive between them elements to be bound, one binder section having an aperture, an anchor secured to the interior of the opposing binder section and having a raised portion spaced somewhat from the opposing binder section and being generally aligned with said aperture, said raised portion having a slot including generally right angular communicating slot portions, a binder post having a threaded end for passage through said aperture, a nut engageable with said threaded end and bearing on said one binder section, and a head on the far end of said post insertable through said slot to a position below said raised portion and also removable through said slot, and at least one lug joined to said post and head and entering one portion of the slot and resisting rotation of the post relative to said anchor around the axis of the post.

4,180,341

HINGED BINDER ASSEMBLY FOR SAMPLE CARDS

Carsten Langhorst, Einstmannstr. 33, 2804 Lilienthal, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,248
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713736; Sep. 28, 1977, 2743558; Oct. 26, 1977, 2747931
Int. Cl.[2] G09F *5/00*
U.S. Cl. 402—80 R **9 Claims**



1. A hinged binder assembly for a plurality of stacked planar cards on which rug samples or the like may be mounted, and including a plurality of generally rectangular, hollow rail members individually receiving and holding one end of a sample card, with said rail members lying adjacent to and one above the other when the binder assembly is in a closed position, comprising:

(a) cylindrical lateral channels defined in and extending through respective front and rear walls of each rail member,

(b) a plurality of U-shaped stirrups each including a pair of parallel cylindrical arms and a connecting web, and

(c) a pair of stirrups being connectingly disposed on opposite sides of each adjacent set of upper and lower rail members with one arm of each stirrup rotatably engaged in a rear wall channel of a lower rail member and the other arm rotatably engaged in a front wall channel of an upper rail member, with the web of each stirrup thus lying at an inclined angle between adjacent rail members,

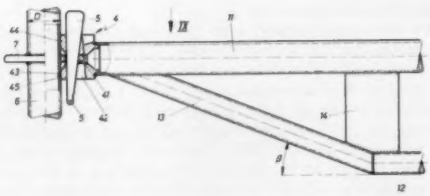
(d) whereby the sample bearing cards may be turned over one at a time in the manner of book pages, or pulled out in a translational manner into a partially overlapping stepped configuration wherein portions of all samples are exposed for viewing.

4,180,342

ARRANGEMENT FOR CONNECTING STRUCTURAL MEMBERS

Eberhard Layher, D-1729 Guglingen-Eibensbach Wurtt., Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,648
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737859
Int. Cl.[2] E04G *7/00*; F16B *7/00*
U.S. Cl. 403—24 **15 Claims**

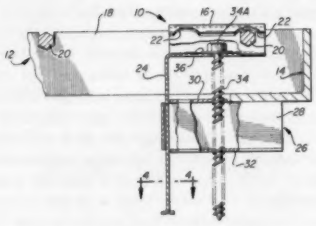


1. An arrangement for connecting structural members, particularly members of a frame or scaffold, comprising a first elongated member having two end portions, at least one of said end portions being provided with an elongated recess having one open end and a first throughgoing passage extending substantially transversely to the elongation of said recess; a second elongated member to be connected with said first elongated member; a third member fixedly mounted on said second member and extending outwardly away from the second member, said third member being adapted to be received in said recess when said first and second members are connected to each other, said third member being provided with at least one second throughgoing passage so arranged on said third member as to communicate and bound with said first passage an uninterrupted channel; a fourth member closely receivable in said channel so as to arrest said second member on said first member to thereby prevent any movement of said first and second members relative to one another; and a fifth member fixedly spaced from said first member and having first and second portions, an intermediate portion spaced from said first member and extending substantially parallel thereto, said first and second end portions being bent relative to said intermediate portion in direction towards said first member and being rigidly connected thereto.

4,180,343
GRATING FASTENER

Glenn Finlay, P.O. Box 306, Daingerfield, Tex. 75638

Filed Jul. 13, 1978, Ser. No. 924,244
Int. Cl.[2] F16B 2/12
U.S. Cl. 403—24 10 Claims



1. For use in combination with an externally threaded member, a fastener assembly for securing grating to an underlying support, which comprises:

clip means for engaging the top surface of the grating;

said clip means having an aperture for receiving one end of the externally threaded member;

leg means connected at one end to the clip means and spaced from said aperture and and extending downwardly therefrom through the grating; and

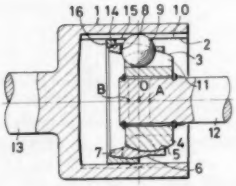
foot means extending outwardly from the leg means and captively supported on by said leg means for slidable linear movement therealong between engaging and non-engaging positions relative to the support;

said foot means having at least one aperture therein coaxial with the aperture in the clip means for threadedly receiving the other end of the externally threaded member.

4,180,344
SLIDABLE TYPE CONSTANT VELOCITY UNIVERSAL JOINT

Nobuyuki Otsuka, Kawagoe; Seiichi Hirai, Sayama, and Motoshige Sogabe, Asaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,607
Claims priority, application Japan, Feb. 13, 1978, 53-1407153; Mar. 13, 1978, 53-3085453
Int. Cl.[2] F16D 3/00
U.S. Cl. 403—57 2 Claims

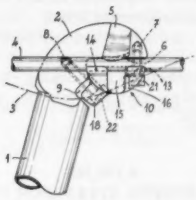


1. A slidable type constant velocity universal joint having an outer member, said outer member being formed of an inner cylindrical surface, and provided therein with an inner member having an outer spherical surface; a cage member; said cage member being mounted on the inner member and having an inner spherical surface and an outer spherical surface respectively; each being eccentric with respect to each other; a plurality of balls provided in said cage member, being mounted in respective windows; guide grooves formed in mutually facing surfaces of said outer member and the inner member; said respective balls being in engagement with corresponding respective pairs of longitudinal directed guide grooves; wherein: an annular guide member means an annular guide member means disposed between said cage member and said outer member, said guide member means having an outer cylindrical surface in proximity to said outer member and an inner part-spherical surface in proximity to said cage member for permitting slidable engagement between said outer member and said inner member.

4,180,345
SADDLE SUPPORT FOR BICYCLES AND THE LIKE

Jean-Paul Routens, 8, Cours Berriat, Grenoble (Isere), France

Filed Jun. 20, 1978, Ser. No. 917,160
Int. Cl.[2] F16C 11/00
U.S. Cl. 403—84 6 Claims

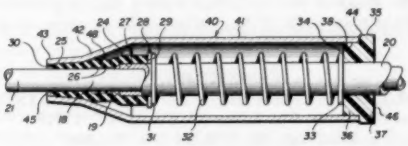


1. A saddle support for bicycles and the like, of the type constituted by a saddle stem terminating in a head comprising means for adjusting the longitudinal position and the inclination of a saddle frame to be supported by the head, wherein the head of the saddle stem comprises, on each of two side faces, a projection formed with a groove whose base, directed downwards, has a substantially arcuate shape, and a cradle adapted to be fixed below the head of the saddle stem by means of two screws located one in front of the other and both ahead of said stem, said cradle having on each side, two recesses having upwardly directed coaxial cylindrical bases, each of two longitudinal members of the saddle frame being intended to be introduced and clamped in a groove in the head of the saddle stem and in the two corresponding recesses of the cradle, located on either side of the groove.

4,180,346
COUPLING FOR TELESCOPING MEMBERS

William J. Blake, Lombard, Ill., assignor to Robert L. Swanson, Lombard, Ill., a part interest

Filed Mar. 13, 1978, Ser. No. 885,963
Int. Cl.[2] F16B 7/10
U.S. Cl. 403—109 12 Claims



1. In combination, an outer tubular member, an inner member telescopically slidable within said outer tubular member, and a coupling assembly for said members, said coupling assembly comprising:

a tubular locking element having a first portion located around the outside of said outer tubular member adjacent one end of the outer tubular member;

said tubular locking element having a second portion extending axially from said first portion and encompassing the untelescoped part of said inner member adjacent said one end of the outer tubular member;

said tubular locking element having a pair of opposite ends and comprising a plurality of elongated ridges extending

longitudinally on the outside of the tubular locking element between said opposite ends;

gripping means, on said second portion of the tubular locking element, actuable between operative and inoperative dispositions thereof;

a tubular actuating element located around the outside of said locking element;

means on said actuating element for engaging said elongated ridges on the locking element to actuate said gripping means into an operative disposition in which said gripping means grips said inner member to hold the latter against movement in an axial direction relative to the locking element and the outer tubular member;

said plurality of longitudinal ridges on said locking element comprising means, responsive to said engagement of said ridges by said means on said actuating element, for providing radially inwardly directed compressive forces on said gripping means from a plurality of regularly spaced angles around the periphery of the locking element;

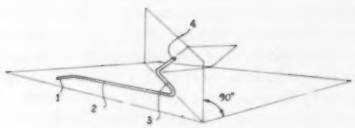
and means normally urging said gripping means to its inoperative disposition.

4,180,347

FOUR BRANCH SPRING STEEL JAM FASTENER CLIP FOR ASSEMBLY OF OPEN EXTRUSIONS

Maurice Piget, Boisset les Prevanches, 27120 Pacy sur Eure, France

Filed Sep. 15, 1978, Ser. No. 942,731
Int. Cl.[2] B25G *3/00*; F16B *5/06*
U.S. Cl. 403—405 **6 Claims**



1. A jam fastener for assembling together two elongated members, one of which has a sharp cornered U-shaped cross-section with an inturned edge on one of its arms, comprising:

(a) a spring steel wire clip having four distinct continuous branches each being bent at an angle with respect to its adjacent branch or branches,

(b) the first three branches lying in a common bending plane,

(c) the third and fourth branches defining a dihedral plane which forms a predetermined angle with the bending plane,

(d) the fourth branch forming an acute angle with the third branch, and

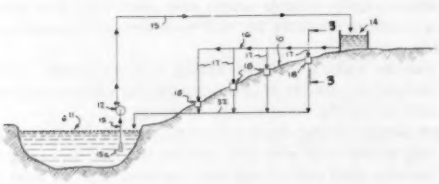
(e) the length of the fourth branch being slightly greater than the internal width of the desired profile member assembly.

4,180,348

SUBSURFACE IRRIGATION AND DRAINAGE SYSTEM

Richard H. Taylor, Rte. 1, Box 97, Como, N.C. 27818

Filed Nov. 22, 1978, Ser. No. 964,806
Int. Cl.[2] E02B *11/00, 13/00*
U.S. Cl. 405—39 **19 Claims**



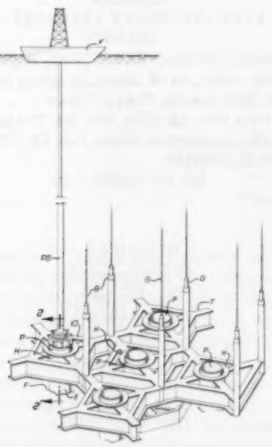
1. An irrigation and drainage system for cultivated fields, croplands and the like for supplying and extracting water and similar liquids through a subsurface conduit network automatically responsive to the ground water table occurring above or below a predetermined subsurface reference level near the depth of the conduit network, comprising a plurality of elongated subsurface perforated conduit lines at spaced apart locations throughout the field each extending along a horizontal path at a uniform depth below ground along a predetermined reference ground elevation contour line for a chosen ground elevation for outflow of water from said conduit lines through said perforations into the adjacent subsoil when the ground water level is below said reference level and for inflow of ground water through the perforations into said conduit lines when the ground water level is above said reference level, a distribution box for the conduit lines for each different reference ground elevation contour line having a main water collection compartment for holding water at a selected water level therein communicating said water level with the contour lines served thereby for liquid egress and ingress to and from the contour lines, means for supplying water to the main water collection compartments of said distribution boxes from a water supply source located at a higher elevation than the conduit lines, weir means in each distribution box defining an overflow compartment for overflow of excess water from said main water collecting compartment exceeding said selected water level, and excess water conduit means interconnecting the overflow compartments of said distribution boxes with the water collecting compartments of other of said distribution boxes in a predetermined order.

4,180,349

PILE FORGING

Bernard H. van Bilderbeek, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed Jan. 30, 1978, Ser. No. 873,357
Int. Cl.[2] E02D *5/54*
U.S. Cl. 405—224 **1 Claim**



1. The method of anchoring a frame structure on the floor of a body of water comprising: disposing a pile in a pile housing in the frame structure with the pile extending from the housing and into the earth below the floor, said housing having a circumferential recess therein; lowering from the surface of the water a rotatable pipe string having a fluid pressure expansible forge tool at the lower end of the pipe string; positioning said forge tool on said pipe string in said pile and with respect to said recess; centering said forge tool in said pile on a swivel seated on said pile, applying fluid pressure through said pipe string to expand said forge tool while rotating said pipe string and said forge tool in said swivel and deforming said pile into

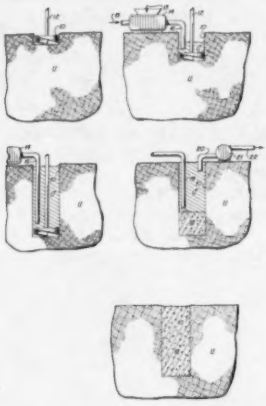
said recess; contracting said forge tool and removing said forge tool and said swivel on said pipe string from said pile.

4,180,350

METHOD FOR FORMING FOUNDATION PIERS

James P. Watts, Scottsdale, Ariz., assignor to Early California Industries, Inc., Los Angeles, Calif.

Filed Mar. 30, 1978, Ser. No. 891,633
Int. Cl.² E02D *5/30*
U.S. Cl. 405—233 **4 Claims**



1. In the method of forming foundation piers including drilling holes in the earth,
providing lateral support for the side walls of said holes using a slurry of earth support material above said drill as drilling progresses, and
injecting a plastic concrete mixture into said holes to displace said slurry upwardly, thereby filling the holes with said concrete mixture which hardens to form said foundation piers,
the improvement comprising the step of:
(a) mixing said slurry under high shear mixing conditions whereby uniformly consistent slurries of preselected variable densities are provided to lend lateral support to the sides of said holes, and
(b) varying the density of the slurry injected into said hole as drilling progresses.

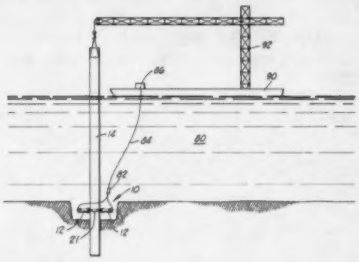
4,180,351

METHODS AND APPARATUS FOR SEVERING REINFORCED CONCRETE PILINGS

Larry M. Orrill, Arlington, and John A. Regalbuto, Fort Worth, both of Tex., assignors to Jet Research Center, Inc., Arlington, Tex.

Filed May 25, 1978, Ser. No. 909,584
Int. Cl.² E02B *1/00*
U.S. Cl. 405—303 **12 Claims**

1. A method of severing a concrete piling containing two or more longitudinally extending reinforcing rods comprising the steps of:
positioning at least two projectile guns around said piling in a plane transverse to said reinforcing rods at a point thereon where it is desired to sever said piling, each of said projectile guns being positioned in alignment with one of said reinforcing rods,
clamping said projectile guns together and to said piling,
said projectile guns including an elongated barrel, a projectile positioned within said barrel of a size and shape capable of penetrating said piling and severing said reinforcing rods upon striking said piling and explosive means attached to said barrel for propelling said projectile through said barrel and into contact with said piling; and



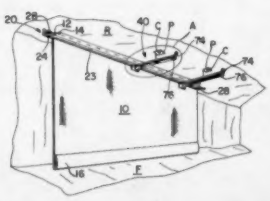
simultaneously detonating said explosive means whereby said projectile is caused to penetrate said piling and sever said reinforcing rods.

4,180,352

EXTENSIBLE BRATTICE AND CANTILEVERED ROOF MOUNTED SUPPORT SYSTEM THEREFOR

Edward F. Divers, Pittsburgh, Pa.; D. Randolph Berry, Sudbury, and David A. Monaghan, Newtonville, both of Mass., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 7, 1978, Ser. No. 958,578
Int. Cl.² E21F *1/00, 3/00*
U.S. Cl. 405—303 **10 Claims**



1. A cantilevered support system for an extensible mine ventilation brattice which is adapted to cooperate with roof bolts in the mine, the system comprising:
support means to which the brattice is mounted, and which defines a track; and
mounting means for suspending said support means from at least one of the roof bolts, said mounting means comprising:
coupling means connected to said support means in sliding engagement with said track so as to allow displacement of said support means, and hence extension of the brattice, relative to said mounting means;
an elongate member connected to said coupling means;
an upstanding leg member connected to said elongate member at a location longitudinally spaced from said coupling means, and such that the distal end of said leg member abuts the mine roof when said elongate member is in the operative position thereof; and
connecting means for connecting said elongate member in depending relation to the at least one of the roof bolts at a position on said elongate member intermediate said coupling means and said leg member.

4,180,353

PISTON PUMP FOR USE IN GASIFYING FINE GRAINED AND DUST-LIKE SOLID FUELS

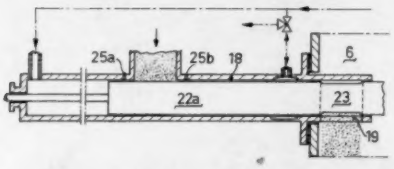
Ulrich Geidies, Waltrop, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,747

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722931

Int. Cl.[2] B65G *65/58*

U.S. Cl. 406—74 **6 Claims**



1. A solids pump for use in pumping fine grained and dust-like fuel by way of a pressurized lock basin into a gasifier operating at an elevated pressure,

the said pump comprising

an outer cylinder;

a piston movable in said cylinder and terminating rearwardly short of the end of said cylinder;

an inlet opening for said fuel in the top of said cylinder;

a hollow space in said piston for receiving said fuel, the said hollow space being open at the top and bottom;

a port in said top wall of the cylinder for a gaseous medium under pressure;

an outlet passage for said fuel in the bottom of said cylinder;

valve means for controlling the flow of said pressure gas through said port;

means for moving said piston in said cylinder so as to bring said hollow space, in a first position, into alignment with said fuel inlet opening to receive said fuel, then, in a second position, to bring the piston into alignment with said pressure gas port so as to cause the pressure gas to respectively enter and exit the fuel filled hollow space and, in a third position, to bring the piston in alignment with said fuel outlet passage so as to discharge the fuel into the lock basin; and

additional valve means for passing pressure gas through said port into the space behind the piston to at least assist the movement of the piston.

4,180,354

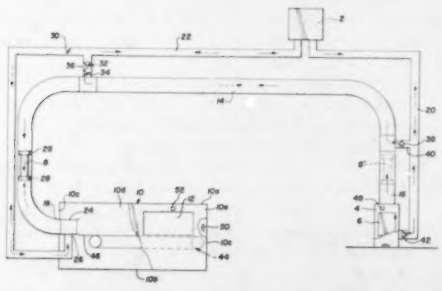
PNEUMATIC TRANSMISSION SYSTEM

Harold R. Greene, 2617 Tarna, Dallas, Tex. 75229

Filed Dec. 15, 1977, Ser. No. 860,744

Int. Cl.[2] B65G *51/34*

U.S. Cl. 406—112 **5 Claims**



1. A free delivery transmission system to move a carrier comprising: a closed terminal adapted to receive a carrier; a reversible blower adapted to supply pressurized air to an outlet and draw a partial vacuum at an inlet; a transmission line having a first end connected to the closed terminal and a second open end spaced from said closed terminal; a first air line extending between the outlet of the blower and the closed terminal; a second air line extending between inlet of the blower and the transmission line adjacent the open end of the transmission line; adjustable valve means positioned in said second air line to adjust the flow of air between the transmission line and the second air line; a conduit extending between a position spaced from the open end of the transmission line and the second air line; and a check valve in said conduit means adapted to release pressurized air from the transmission line to the second air line as the carrier nears the end of the transmission line such that the rate of deceleration of the carrier is controlled by the flow of air through the second air line.

4,180,355

DETACHABLE BLADE FOR CUTTING TOOL

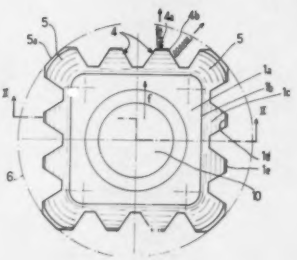
Antoine Nanini, Vougy-Bonneville, France, assignor to Societe Igman, Bonneville, France

Filed May 22, 1978, Ser. No. 908,290

Claims priority, application France, Jun. 2, 1977, 77 16859

Int. Cl.[2] B26D *1/00*

U.S. Cl. 407—113 **3 Claims**



1. A detachable blade for cutting tool, said blade having the form of a straight prism of small height, of square cross section and with side faces having trapezoidal teeth, wherein each of the front faces of the blade presents a hollow portion in the form of a frustum of a pyramid with a square base, the large base of which is substantially connected to the edges of the front face.

4,180,356

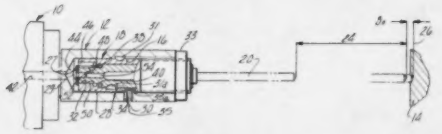
BROKEN TOOL DETECTOR

Norman J. Hoch, 13760 LaBelle, Oak Park, Mich. 48237

Filed Aug. 3, 1978, Ser. No. 930,699

Int. Cl.[2] B23B *39/04, 39/00*

U.S. Cl. 408—8 **14 Claims**



1. A detecting apparatus for a machine tool comprising; a head member, a spindle assembly supported by said head member, means for rotating said spindle assembly and moving it axially from an initial position through a full cycle including an approach phase in which said spindle assembly and a workpiece are moved relative to each other and a feed phase during which work is done on said workpiece, a tool supported by said spindle for rotation therewith and limited axial movement relative thereto, means biasing said tool and spindle to an axially extended position and resisting relative axial movement

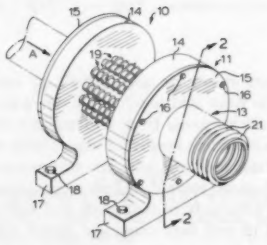
with a predetermined force when said tool engages an obstacle, means associated with said spindle and being responsive to relative axial movement of said spindle and said tool to generate a signal, a timer activated for a predetermined period of time in a selected one of said phases, said timer being responsive to the presence of said generated signal in said feed phase to continue said cycle and being responsive to said generated signal in said approach phase to discontinue said cycle.

4,180,357

APPARATUS AND METHOD FOR PERFORATING TUBING AND METHOD OF PRODUCING PART OF SUCH APPARATUS

Gerd P. H. Lupke, 46 Stornoway Crescent, and Manfred A. A. Lupke, 35 Ironshield Crescent, both of Thornhill, Ontario, Canada

Filed Feb. 27, 1978, Ser. No. 881,417
Claims priority, application Canada, Mar. 18, 1977, 274316
Int. Cl.[2] B23C *3/00*; B26D *3/06*
U.S. Cl. 409—131 **26 Claims**



1. Apparatus for perforating tubing, the apparatus comprising:

drive means for advancing the tubing along an axial path thereof,

at least one pair of cutters mounted for rotation about respective fixed axes spaced from and substantially parallel to said axial path of the tubing,

the cutters of each pair being mounted for rotation through complete revolutions about said fixed axes along fixed circular paths which intersect the tubing for intermittent intersection of the tubing by the cutters at discrete points on the tubing, and

means for rotating the cutters of each pair in synchronism in opposite directions for substantially simultaneous intersection with the tubing,

whereby the cutters support the tubing to restrain it against rotation during operative intersection of the tubing by the cutters.

4,180,358

PIPE BEVELING ATTACHMENT FOR A POWER TOOL

Charles E. Uribe, Rte. 1, Box 11-B, Milton-Freewater, Oreg. 97862

Continuation-in-part of Ser. No. 848,991, Nov. 7, 1977, abandoned, and a continuation-in-part of Ser. No. 769,921, Feb. 18, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,501
Int. Cl.[2] B23C *1/20*
U.S. Cl. 409—179 **9 Claims**

5. A pipe beveling attachment for a power tool having a rotary cutter, comprising:

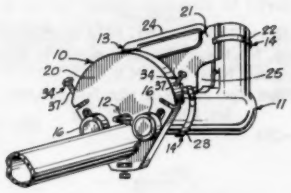
a base member;

support means on the base member for mounting a power tool thereto with the rotary cutter facing the base member;

an opening formed through the base member for receiving the rotary cutter of the power tool;

a freely rotatable core engaging roller;

core roller adjusting means on the base member mounting the core engaging roller to the base plate for selective movement of the core engaging roller in relation to the opening;



outside roller means to each side of said core engaging roller for engaging and rolling over the outside surface of a pipe end whose inner surface is engaged by the core engaging roller to thereby guide the cutting tool in an arcuate path relative to the axis of the pipe end;

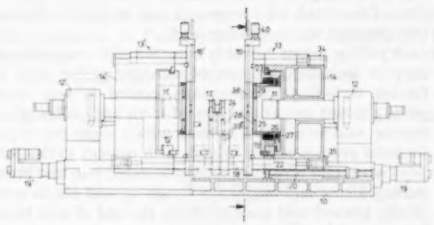
said support means being movably adjustable relative to said outer roller means.

4,180,359

MACHINE TOOL FOR MACHINING OF SHAFTS, ESPECIALLY CRANKSHAFTS

Karlheinz Schmid, Neckartenzlingen, Fed. Rep. of Germany, assignor to Gebrueder Heller Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,542
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658970
Int. Cl.[2] B23C *3/08*
U.S. Cl. 409—197 **4 Claims**



1. A machine tool for milling crankshaft (**17**) having a longitudinal axis (**24**), comprising a machine bed (**10**), crankshaft clamping means (**12**, **12'**) including chuck means (**11**, **11'**) operatively supported on said machine bed (**10**), two milling units (**13**, **13'**) also operatively supported on said machine bed for displacement along the machine bed in parallel to said longitudinal axis (**24**) of said crankshaft, each milling unit (**13**, **13'**) comprising respective tool drum means (**25**) arranged substantially coaxially relative to said longitudinal crankshaft axis (**24**), said machine tool further comprising crankshaft supporting means (**16**, **16'**) each carried by the respective milling unit (**13**, **13'**), at least one of said crankshaft supporting means (**16**) being movably carried by the respective milling unit (**13**), and drive means (**34**, **35**) operatively connected to said one crankshaft supporting means (**16**) for moving the respective crankshaft supporting means back and forth in parallel to said longitudinal crankshaft axis (**24**) independently of any movement of the respective milling unit between a working position and a rest position so that said crankshaft supporting means may support the crankshaft in the working position directly adjacent to the respective one of said tool drum means and so that said crank-

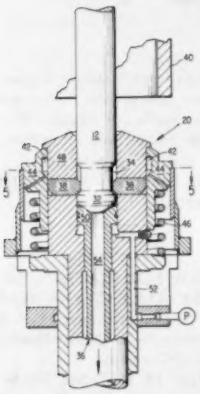
shaft supporting means may take up said rest position around the respective tool drum means, whereby pairs of crankshaft bearing surfaces having a common axis may be machined simultaneously even if said bearing surfaces are located adjacent to each other.

4,180,360

BROACH PULLING MECHANISM

James W. Dopp, Rochester, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,442
Int. Cl.[2] B23B *41/04*
U.S. Cl. 409—287 **6 Claims**



1. A puller mechanism for pulling a broach through a workpiece comprising:

a support for mounting a workpiece thereon;

a broach having a circumferential groove near the end thereof mounted with respect to said support to be movable through the workpiece; and

broach pulling means movably mounted with respect to said support including a series of movable puller jaws and further including piston means located in said broach pulling means and axially spaced from said puller jaws to support said broach in a position which aligns the circumferential groove of said broach with respect to the puller jaws when said broach is initially inserted into said broach pulling means and means for actuating said piston means axially toward said jaws to clamp the end of said broach between said puller jaws and said piston means whenever said jaws are moved into said circumferential groove of the broach to allow the broach to be pulled through the workpiece without any drop of the broach with respect to the broach pulling means during any part of the movement of the broach through the workpiece.

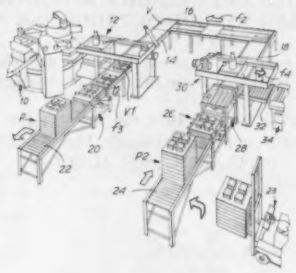
4,180,361

PLANT FOR HANDLING CEMENT TILES AND SIMILAR ARTICLES THAT REQUIRE A SEASONING AND SUBSEQUENT WORKINGS

Enrico Longinotti, Via Timoteo Bertelli 2, Firenze, Italy

Filed Mar. 31, 1978, Ser. No. 892,134
Claims priority, application Italy, Apr. 15, 1977, 9413 A/77
Int. Cl.[2] B65G *60/00*
U.S. Cl. 414—32 **7 Claims**

1. An apparatus for handling articles of manufacture such as tiles and the like for transporting said articles sequentially through a plurality of operating stations comprising: a first conveying means, a charging station disposed adjacent said first conveying means, a plurality of trays adapted to be disposed on said first conveying means whereby said first conveyor means advances said trays seriation toward said charging station, said charging station including means for stacking said articles onto the trays in said charging station, a tray piling station disposed downstreamwise of said charging station, said tray piling station having means for stacking a plurality of trays containing said stacked articles one upon the other as the respective trays pass through said charging station, a second conveyor means adapted having an end portion adapted to receive a plurality of stacked trays containing subsequently processed articles, a tray unpiling station associated with said



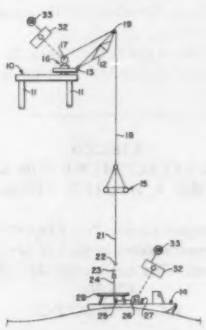
second conveyor means, an article pick up station disposed downstreamwise from said unpiling station whereby the processed articles are removed from said unpiled trays, said tray unpiling station including means for sequentially removing said trays from said stacked trays whereby said unstacked trays are sequentially advanced toward said pick-up station to effect the removal of the articles from said trays, and said emptied trays being recycled to said first conveyor means on an interconnecting conveyor for advancement toward said charging station.

4,180,362

SYSTEM TO TRANSFER CARGO OR PASSENGERS BETWEEN PLATFORMS WHILE UNDERGOING RELATIVE MOTION

Leslie D. Stair, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 5, 1978, Ser. No. 903,372
Int. Cl.[2] B65G *67/58*
U.S. Cl. 414—139 **12 Claims**



1. Apparatus to control the rate of closure or separation and the landing site for cargo or personnel during transfer between first and second platforms while subject to vertical or lateral motion, one with respect to the other, said apparatus including the combination of:

a constant tension winch on said first platform, said constant tension winch including means to establish a first constant

tension level in the winch cable extending from said first platform,

a variable constant tension winch on said second platform, said variable constant tension winch including means to establish second and third constant tension levels in the winch cable extending from said second platform, said second constant tension level being essentially less than said first constant tension level and said third constant tension level being essentially greater than said first constant tension level,

engagement means to connect together the cables of said constant tension winch and said variable constant tension winch,

carrier means coupled for movement by said cables while connected together by said engagement means, and

control means operative to select one of said second and third constant tension levels for establishing the direction of movement of said carrier means between said first platform and said second platform by the relative tension differential between said first constant tension level and the selected second or third constant tension level.

4,180,363

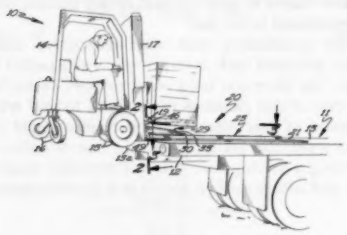
ATTACHMENT DEVICE FOR A FORK LIFT

Douglass W. Steiger, and Clifton E. Johnson, both of R.R. 2, Red Lake Falls, Minn. 56750

Filed Mar. 30, 1978, Ser. No. 891,495

Int. Cl.[2] B60P *1/64*

U.S. Cl. 414—347 **8 Claims**



1. An attachment device for a fork lift and a support structure, such as a truck bed, having an elevated flat upper surface and having a rear edge, the fork lift including a body having ground engaging wheels, a fixed frame on the front of the body, a vertically shiftable lift frame on the fixed frame movable between raised and lowered portions,

an elongated track on the elevated support surface,

a carriage engaging said track and being movable therealong,

a carriage-engaging member mounted on the lift frame and being vertically movable therewith, said carriage-engaging member being engageable with the carriage when the lift frame and carriage-engaging member are shifted vertically downwardly from a raised portion, whereby the fork lift upon further downward shifting movement of the lift frame the fork lift will be elevated and supported by the carriage so that the ground engaging wheels will be positioned at the same level as the elevated upper surface, and means on said carriage-engaging member engaging the upper support surface and impelling the fork lift along said upper support surface until the ground engaging wheels are supported on the support surface.

4,180,364

PONTOON LAUNCHING

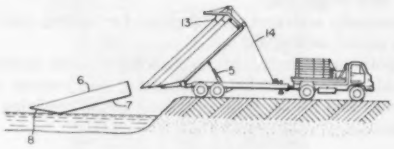
James P. Fitzgerald-Smith, Ossemsley nr. New Milton, and Derek I. Knight, Bournemouth, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 22, 1978, Ser. No. 879,989

Claims priority, application United Kingdom, Feb. 23, 1977, 07734/77

Int. Cl.[2] B60P *1/04*

U.S. Cl. 414—350 **12 Claims**



1. A launch vehicle for nestable slideable pontoons, the vehicle comprising:

(a) a platform to support two or more pontoons when stacked, by nesting each pontoon within another, in a substantially vertical stack,

(b) anchoring means to separately anchor each of the pontoons to the platform,

(c) tilting means to tilt the platform, and

(d) releasing means, co-operable with said anchoring means, to release separately each pontoon in a sequence from the uppermost to the lowermost of the pontoons, whereby, in use, the released pontoons slide downwardly of the tilted platform to clear the vehicle.

4,180,365

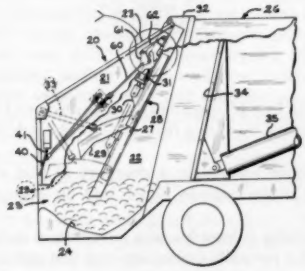
HYDRAULIC SYSTEM FOR A REFUSE TRUCK

William A. Herpich, and George W. Palmer, both of Galion, Ohio, assignors to Peabody International Corporation, Galion, Ohio

Filed May 3, 1978, Ser. No. 902,338

Int. Cl.[2] B65F *3/20*

U.S. Cl. 414—525 **10 Claims**



1. A refuse compacting apparatus comprising, in combination,

(a) a compaction chamber defined by at least a floor, two side walls and a barrier extending across between said side walls which defines an end of said chamber,

(b) a refuse accumulating zone communicating with the other end of said chamber,

(c) a packer blade,

(d) means mounting said packer blade for movement through a closed path from a refuse confining position closing the other end of said chamber for confining refuse in said chamber, to a remote position beyond said zone, and through said zone toward such confining position for

moving refuse into said chamber and compacting the same against said barrier,

(e) an hydraulic system comprising

(1) a pump for supplying fluid to said system at a predetermined maximum system pressure,

(2) a hydraulic, double acting cylinder and piston for moving said packer blade,

(3) a supply line to the power side of said cylinder including a valve that is manually movable from neutral to a power position for directing fluid to said cylinder, and

(4) means responsive to pressure in said supply line less than maximum system pressure for causing said valve to shift to neutral,

(f) manually activated control means for holding said valve in power setting, and

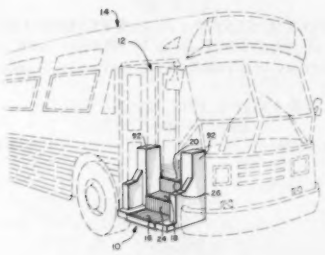
(g) position responsive means responsive to the position of said packer blade for de-activating said control means when said packer blade reaches a refuse confining position.

4,180,366

LIFT ASSEMBLY FOR TRANSIT VEHICLES

Carl W. Roth, Barrington, Ill.; Hugh F. Groth, Brecksville, Ohio, and G. B. Kirby Meacham, Cohasset, Mass., assignors to Vapor Corporation, Chicago, Ill.

Filed Dec. 7, 1977, Ser. No. 857,745
Int. Cl.[2] B60P *1/44*
U.S. Cl. 414—540 **13 Claims**



1. In a vehicle, a lift assembly for lifting wheelchairs and the like from ground level to a floor level of the vehicle comprising:

a main frame secured to a doorway of said vehicle that defines an envelope in which said lift assembly is positioned;

means defining at least first and second steps including pivot means for pivotally connecting said first and second steps;

at least one side linkage member pivotally secured to said first and second steps;

at least one side frame member to which said linkage member is pivotally connected and supported thereby;

at least one scissors linkage member pivotally and slideably connected to said main frame and to said side frame member;

means for pivoting said step means relative to said side frame member to form a platform extending from said vehicle; and

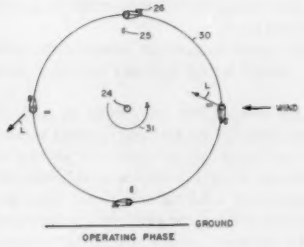
means for pivoting said scissors linkage to and through the center of said scissors linkage to reverse the position of said scissors linkage and move said side frame member and said platform from said floor level to said ground level.

4,180,367

SELF-STARTING WINDMILL ENERGY CONVERSION SYSTEM

Herman M. Drees, Box 7, Marstons Mills, Mass. 02648

Filed Feb. 10, 1975, Ser. No. 548,435
Int. Cl.[2] F03D *3/06*
U.S. Cl. 416—119 **15 Claims**



1. A wind turbine apparatus comprising

movable means for producing rotary motion;

a plurality of air-foil shaped wind responsive elements pivotally mounted on said movable means for exposure to the wind, each said responsive element having a wind responsive surface at least a portion of which is substantially parallel to said rotary motion;

means for maintaining said wind responsive elements at pivotal positions such as to provide a drag force in one direction on a wind responsive surface of at least one of said elements in response to said wind when the speed of said rotary motion is below a predetermined level and to prevent the imposition of a drag force in a different direction on the others of said elements, the drag force in said one direction thereby providing a driving force for said movable means to produce said rotary motion below said predetermined level; and

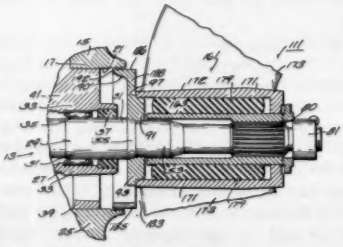
means for maintaining said wind responsive elements at pivotal positions such as to provide a substantial lift force in said one direction on a wind responsive surface of at least one of said elements in response to said wind when the speed of said rotary motion is above said predetermined level, the lift force in said one direction thereby providing a driving force for said movable means to produce said rotary motion above said predetermined level.

4,180,368

MARINE PROPELLER FISH LINE AND WEED CUTTER

Donald A. Hearich, Lake Villa, and Edgar Rose, Glencoe, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 16, 1978, Ser. No. 878,323
Int. Cl.[2] B63H *1/26*
U.S. Cl. 416—146 R **18 Claims**



1. A marine propulsion device comprising a lower unit

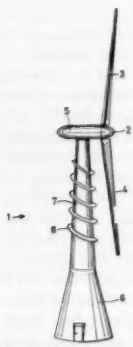
including a gear case including a hollow interior having at the rearward end thereof an inwardly extending inner circular surface defining an opening through which exhaust gases and engine cooling water are discharged from said lower unit, a propeller shaft rotatably journalled in said gear case and including a portion extending rearwardly of said gear case, a propeller including an inner part mounted on said propeller shaft rearward portion for common rotation of said inner part with said propeller shaft, an outer part having an outer circular surface with a diameter materially less than the diameter of said inner circular surface of said gear case, a blade extending radially outwardly from said outer part, and resilient means connecting said inner and outer parts, and a thrust washer carried by said propeller shaft in forward thrust transmitting engagement therewith and in forward thrust receiving engagement with said outer part, and means on said thrust washer extending into the area between said inner circular surface of said gear case and said outer circular surface of said outer part of said propeller and including an annular sleeve extending adjacent to said inner circular surface of said gear case and rearwardly from said gear case toward said propeller.

4,180,369

WIND MILLS

Gert O. Ottosen, Frederikssundsvej 25, 3. to, 2400 Copenhagen NV, Denmark

Filed Feb. 2, 1978, Ser. No. 874,619
Claims priority, application Denmark, Feb. 4, 1977, 477/77
Int. Cl.[2] F03D *1/04*
U.S. Cl. 415—2 **11 Claims**



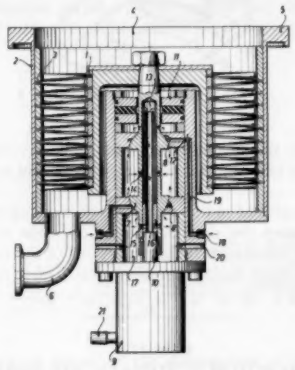
1. A wind mill, comprising
(a) a vertical rigid tower (6,7);
(b) a wind turbine (5) connected with the upper end of said tower for rotation about a vertical axis;
(c) a propeller (2) connected with the wind turbine for rotation about a horizontal axis, said propeller having at least two blades; and
(d) strip means (8) generally rectangular cross-sectional configuration extending generally helically about at least the upper portion of said tower, the longitudinal edges of said strip means being adjacent and remote from said tower, respectively, thereby to reduce the effects of the wind on the tower and on the propeller blades.

4,180,370

TURBOMOLECULAR PUMP

Karl-Heinz Klatt, Jülich, and Eckard Kussel, Duren, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 669,264, Mar. 22, 1976, abandoned. Filed Dec. 19, 1977, Ser. No. 861,546
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1975, 2512828
Int. Cl.[2] F01D *1/36*
U.S. Cl. 415—90 **4 Claims**



1. A high speed turbomolecular pump pneumatically driven and pneumatically journalled having a housing and a vacuum chamber, which includes in combination: a turbine stator stationarily arranged in said housing, a turbine rotor likewise arranged within said housing for cooperation with said turbine stator, a rotor shaft operable at rotary speeds within a range of approximately 10,000 rpm having said turbine rotor connected thereto for rotating said turbine rotor relative to said turbine stator, a pressure gas turbine having an output shaft drivingly connected to said rotor shaft for rotating the latter, said rotor shaft having one end portion located remote from its driving connection with said pressure gas turbine and in the vicinity of said vacuum chamber, pneumatic bearing means arranged in said pump housing and rotatably journalling said rotor shaft, duct insert means arranged vacuum tight in said pump housing and sealingly surrounding said end portion of said rotor shaft relative to said vacuum chamber and relative to said pneumatic bearing means, said duct insert means having filled thereagainst a magnetic sealing liquid with low vapor pressure, magnetic means associated with said magnetic sealing liquid for retaining the latter in its sealing position both during operation of the turbomolecular pump and also during standstill precluding entry of air into the vacuum chamber when the pump is off, and means establishing communication between said pneumatic bearing means and an area within the region of said duct insert means for cooling said duct insert means by the gaseous medium from said pneumatic bearing means.

4,180,371

COMPOSITE METAL-CERAMIC TURBINE NOZZLE

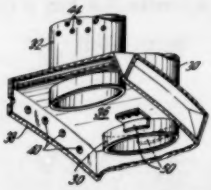
Theodore Ivanko, Fairfield, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Mar. 22, 1978, Ser. No. 888,922
Int. Cl.[2] F01D *5/18, 5/28*
U.S. Cl. 415—115 **5 Claims**

1. A turbine nozzle comprising:
an outer casing, said outer casing being of a predetermined metal composition with means to affix its location;
an inner case of similar metal, said inner casing having a passageway therethrough and also having means to affix its location;
a first array of vanes, also of similar metal as said outer and

inner casing, said metallic vanes connecting said inner and outer casing and supporting said inner casing to said outer casing, each metallic vane having a hollowed interior open to the passage of the inner casing and adapted to be air cooled;

a second array of vanes made of a solid, ceramic material, said second array of ceramic vanes alternating with the



first array of metallic vanes, each of said ceramic vanes extending between said outer casing and said inner casing; and

spring clips affixed to the outer and inner casing for frictionally locating the ceramic vanes such that the ceramic vanes do not absorb radial excursions of the outer casing and the inner casing during flow of high temperature fluid.

4,180,372

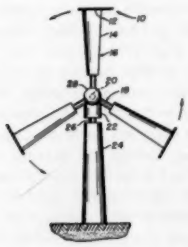
WIND ROTOR AUTOMATIC AIR BRAKE

Joseph Lippert, Jr., Locust Valley, N.Y., assignor to Grumman Corporation, Bethpage, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,538

Int. Cl.[2] F03D *7/04*

U.S. Cl. 416—23 **13 Claims**



1. In a wind-driven motor having a rotor supported for rotation about an axis, an aerodynamic brake mounted on the tip of each blade of said rotor, each of said brakes comprising:

a brake plate pivotally attached to the tip of said blade for relative pivotal deployment therewith;

means responsive to centrifugal forces resulting from overspeed conditions of said rotor for pivotally deploying said plate between a stowed position in which the planform surfaces thereof are substantially parallel to the circumference generated by said blade tip to various deployed positions which extend greater surface areas of said plate into the relative airstream to create levels of drag proportional to said centrifugal forces whereby the rotational speed of said rotor is affected thereby such that the rotor overspeed condition is remedied, said means responsive to centrifugal forces comprising a brake plate weight distribution in which the greater mass is forward of the pivot hinge line of said plate and in the direction of rotation of said rotor blade; and

means for restoring said plate from said deployed positions to said stowed position in response to reductions in said centrifugal forces.

4,180,373

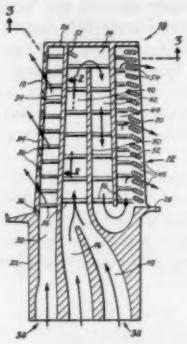
TURBINE BLADE

William A. Moore, Durham, Conn., and Hans R. Przirembel, Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1977, Ser. No. 865,171

Int. Cl.[2] F01D *5/18*

U.S. Cl. 416—97 R **4 Claims**



1. A turbine blade having a hollow elongated body including a root portion at one end and a blade portion extending from said root portion and terminating at a closed tip at the other end of said body, said body including opposing side walls and longitudinally extending leading and trailing edges and having a plurality of generally longitudinally extending wall ribs therein extending between said side walls and partially defining two distinct fluid passageway systems within said body, said passageway systems including a first passageway system having a substantially straight longitudinally extending blind first fluid passage opening through said one end and extending through said root portion into said blade portion and along said leading edge and terminating within said blade portion generally adjacent said tip, said first passageway system having a plurality of transversely spaced rows of longitudinally spaced first outlet passages extending through said leading edge of said blade portion and communicating with said first fluid passage, each of said first outlet passages being inclined to the longitudinal axis of said turbine blade and extending outwardly through said leading edge and in a direction away from said one end, said second fluid passageway system having a three-pass fluid passage including a plurality of generally longitudinally extending and series connected passage sections defining a reversing flow path through the remainder of said body portion, said passage sections including a first passage section in said blade portion and two branch passages in said root portion opening through said one end and merging with each other and with said first passage section at the junction of said root and blade portions, said first passage section and said two brach passages being separated from said first fluid passage by a first one of said wall ribs extending from said one end to said tip and partially defining said first fluid passage, a second passage section adjacent said first section and connected thereto at an outer turning region at said tip end, said second passage section being separated from said first passage section and from said two branch passages by a second one of said wall ribs connected to said root portion at the junction between said root and blade portions and extending toward said tip end in generally parallel relation to said first wall rib and terminating in spaced relation to said closed tip at said outer turning region, and a third passage section connected to said second passage section at an inner turning region proximate the junction of said root and said blade portions and extending within the region of said trailing edge and generally adjacent said second passage section, said third passage section being separated from said second passage section by a third one of said wall ribs extending from said closed tip toward said one end in generally

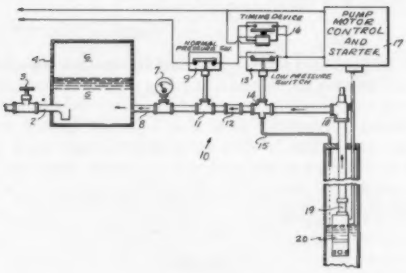
parallel relation to said second wall rib and terminating in spaced relation to said root portion at said inner turning region, said third passage section terminating within said blade portion and adjacent said closed tip, said second fluid passageway system including a longitudinally spaced series of elongated pedestal members disposed between said side walls adjacent said trailing edge and defining a longitudinally spaced series of pedestal slots communicating with said third passage section and opening through said trailing edge, said pedestal slots being inclined to the longitudinal axis of said turbine blade and extending outwardly through said trailing edge and in a direction away from said other end, said side walls having longitudinally spaced and transversely extending trip strips formed thereon, said trip strips projecting from said side walls and into said passageways.

4,180,374

WELL PUMP PROTECTION SYSTEM

Elliott R. Bristow, P.O. Box 292, Grass Valley, Calif. 95945

Filed Mar. 7, 1978, Ser. No. 884,244
Int. Cl.[2] F04B *49/02, 49/06*
U.S. Cl. 417—12 **5 Claims**



1. A well pump protection system comprising a water outlet, a valve within said outlet, a storage tank having water and air connecting serially to said outlet, a pressure gauge connected to said pressure tank remote from said water outlet, and serially upstream, a normal pressure switch having means for allowing water to pass downstream, a low pressure switch provided with means to stop water flow downstream, a timing device connected in parallel to said low pressure switch to act as a time lag sequencing device, a bleeder line disposed proximate to said low pressure switch valve connecting said conduit to a well, a check valve disposed between the normal pressure switch and the low pressure switch permitting fluid flow solely in a downstream direction, a pressure pop off valve located upstream from said low pressure switch, a check valve located upstream from said pressure pop off valve allowing water to only flow downstream, and a submersible motor pump disposed in the well, and a pump motor control and starter connected in series to said low pressure switch and said timing device to activate said motor and pump.

4,180,375

LIQUID CHROMATOGRAPHY PUMP

Haakon T. Magnussen, Jr., Pinole, Calif., assignor to Altex Scientific, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 761,433, Jan. 21, 1977, Pat. No. 4,131,393. This application Jun. 7, 1978, Ser. No. 913,359
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—22 **4 Claims**

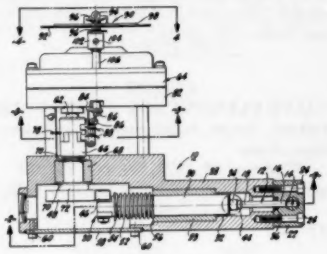
1. A liquid chromatography pump comprising:

a. piston, at least a portion of which is reciprocative within a chamber having a fluid inlet and a fluid outlet, said piston having a first end portion and a second end portion, said first end portion contacting the fluid, said piston being capable of filling and emptying said chamber;

b. motive means for reciprocating said piston within said chamber at a selected substantially constant speed, said substantially constant speed determined by constant speed setting means for fixing said motive means at a substantially constant speed, said motive means contacting said second end portion of said piston;

c. valve means for permitting the filling and emptying of said chamber coordinated with the pressure exerted by said piston within said chamber, said piston, motive means, and valve means cooperating to produce a fluid flow during a particular time period, from said piston chamber relative to said selected substantially constant speed;

d. control means for changing the speed of said motive means at a preselected portion of the time period of said reciprocation of said piston within said chamber, said control means including means for changing the speed of



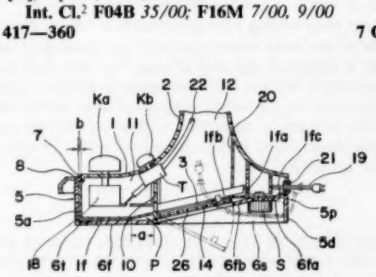
said motive means at the termination of the chamber emptying stroke of said piston, and returning said motive means to said predetermined constant speed after a certain distance of travel of said piston during its subsequent emptying stroke, said motive means speed changing means including pressure measuring means for measuring and signaling the pressure at said piston chamber; and detection means for detecting and signaling the termination of said chamber emptying stroke of said piston, said motive means speed changing means activated upon receipt of said chamber emptying stroke termination signal from said detection means, said motive means returning to said substantially constant speed upon receipt of said pressure signal from said pressure measuring means.

4,180,376

ELECTRIC FAN

Hiroshi Iwaki, and Masaaki Nakamura, both of Kasai, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 29, 1977, Ser. No. 865,687
Claims priority, application Japan, Feb. 23, 1977, 52/22837[U]; Apr. 5, 1977, 52/43379
Int. Cl.[2] F04B *35/00;* F16M *7/00, 9/00*
U.S. Cl. 417—360 **7 Claims**



1. An electric fan comprising a casing of rectangular cubic configuration for accomodating therein electrical components, said casing being integrally formed with a supporting arm extending upwardly therefrom for supporting a motor and blade assembly, and a base portion having a longitudinal recess formed therein the shape of said longitudinal recess being

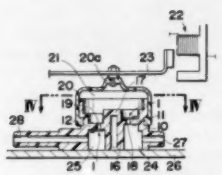
complementary to the shape of said casing and a first engaging portion provided at a forward end of said longitudinal recess for engagement with a corresponding forward end of said casing, said longitudinal recess being formed, in its rear wall at a rear end thereof, with a second engaging portion, and said casing being provided, at its rear lower edge corresponding to said second engaging portion, with a stepped portion which rides over said second engaging portion, at least one of said second engaging portion and said stepped portion being provided with a tapering face, the highest portion of the rear wall of said longitudinal recess being lower than the highest portion of the side walls thereof, wherein when said casing is positioned in said longitudinal recess, said casing is guided by said tapering face and is moved forward into said longitudinal recess for ensuring engagement between said engaging portion at the forward end of said recess and said corresponding forward end of said casing such that substantially all of said casing is positioned within said recess.

4,180,377

VALVE ELEMENT FOR AN AIR PUMP

Tsuyoshi Itakura, Tokyo, Japan, assignor to Itakura Soki Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,582
Claims priority, application Japan, Dec. 14, 1976, 51-167612
Int. Cl.[2] F04B *43/04*
U.S. Cl. 417—413 **4 Claims**



1. In a valve element for an air pump having a cylindrical casing, a resilient membrane connected to one side of said casing, a cover member connected to the other side of said casing and an electromagnetic device for vibrating said membrane,

said casing having beds for securing the valve element on one surface thereof, holes at said beds for an air-flow and inlet and outlet nozzles, and cylindrical holes in said beds for the fixing of said valve elements,

an improvement of said valve element wherein said valve element has a body portion, a tongue portion and a plurality of cylindrical legs formed integral with said body portion and parallel to each other, said legs being uniform cross-sectional cylinders without a flange-holding groove,

said legs each having a longitudinal hole which starts at one side of the body portion to form an opening of said hole and is closed at the end of said leg, said hole having a depth such that the hole terminates at a level substantially horizontal to the other surface of said beds when said valve element is assembled within said casing, said legs being force-fitted into engagement with the sidewalls of said cylindrical holes.

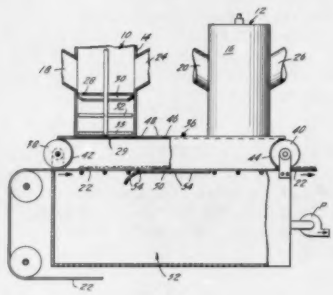
4,180,378

APPARATUS FOR THE DEPOSITION OF DRY FIBERS ON A FORAMINOUS FORMING SURFACE

Dennis L. Mielke, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jun. 15, 1978, Ser. No. 915,866
Int. Cl.[2] B29B *1/00*
U.S. Cl. 425—83.1 **3 Claims**

1. An apparatus for depositing a uniform web of dry fibers on a foraminous wire belt, the combination comprising: at least a pair of fiber distributors having bottom openings disposed in spaced relationship; foraminous screens extending over said openings through which fibers may pass from said distributors; means defining a tunnel extending beneath said openings, in air flow communication therewith, and including a horizontal upper wall portion extending between said distributors; a movable foraminous wire belt disposed within said tunnel for travel therethrough in the direction of spacing of said openings; means for introducing dry fibers to said distributors for discharge through said screens onto said foraminous wire belt as it is moved therepast; means for sealing the ends of said tunnel aginst air leakage while accommodating movement of said belt therethrough; means for producing a partial vacuum below said belt; and means defining perforations in said upper horizontal wall portion of said tunnel for accommodating air flow from outside said tunnel onto the underlying portion of said belt and fibers thereon.

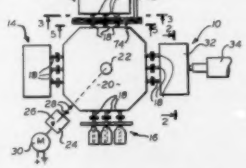


4,180,379

BLOW MOLDING MACHINE WITH ROTATING CORE RODS

Dewey Rainville, Westfield, N.J., assignor to Rainville Company Inc., Middlesex, N.J.

Filed Mar. 15, 1978, Ser. No. 886,798
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—526 **11 Claims**



1. Blow molding apparatus including an injection station, a blow station, and a stripping station angularly spaced around a substantially vertical axis, a core rod support that rotates about said axis, core rods carried by the support and extending generally horizontally from the support into molds at the respective stations, and means for moving the core rods intermittently and successively from one station to the next, characterized by a treatment station located between the injection station and the blow station, said treatment station including a housing with a chamber open at both ends and into which a core rod and its parison extend, the chamber being longer than the parison and extending axially of the parison between said open ends, means for controlling the temperature of the parison on the core rod at said treatment station to obtain a parison temperature that is in the orientation range, or just above it, for the particular material of which the parison is made, said means for controlling the temperature including a passage communicating with said chamber intermediate the ends thereof and in-

cluding also means for blowing heat controlling fluid through the chamber via the passage and open ends, the core rod being rotatable about its axis, and means for rotating the core rod while at the treatment station to reduce sagging of the material of the parison to the underside of the core rod.

4,180,380

ELECTRICAL CONTROLS FOR HEATING APPLIANCES

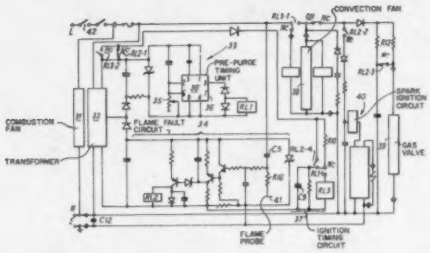
Ronald W. Davies, Birkenhead, England, assignor to United Gas Industries Limited, London, England

Filed Apr. 1, 1977, Ser. No. 783,810

Claims priority, application United Kingdom, Apr. 13, 1976, 14998/76; Dec. 2, 1976, 50250/76

Int. Cl.[2] F23H *5/00*

U.S. Cl. 431—31 **4 Claims**



1. A gas or oil-fired appliance having a combustion air fan, and electrically-operated fuel valve, an ignition device and a control circuit comprising a plurality of electrical sub-circuits each adapted to carry out and/or monitor part of a start-up sequence of a timed purge period followed by a timed ignition period followed either by normal operation or by a close-down operation if a flame is not detected, each said sub-circuit having a relay connected to operate switching devices for effecting the appropriate part of the start-up sequence, and one of said sub-circuits having timing means for timing the ignition period and comprising an ignition timer relay and a capacitor connected to discharge through said relay until the capacitor is discharged, the said switching devices for said one sub-circuit being connected to be operated by said ignition timer relay and to maintain the fuel valve open and the ignition device operative during said ignition period, a second one of said sub-circuits having means for detecting the occurrence of a flame and including a flame-detector relay connected to operate the said switching devices for said second sub-circuit, one of which switching devices connects an alternative power supply to maintain said ignition timer relay operated after said ignition period when a flame is detected, and said combustion fan being connected to be energized on start-up independently of any of said relay-operated switching devices of the control circuit.

4,180,381

MEANS FOR TILTING CRUCIBLE FURNACES

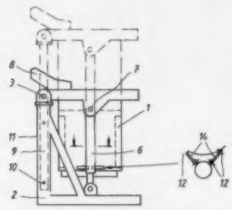
Yngve Caisander, Helsingborg, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Feb. 23, 1978, Ser. No. 880,541

Claims priority, application Sweden, Feb. 28, 1977, 7702148

Int. Cl.[2] F27B *14/02*

U.S. Cl. 432—157 **4 Claims**



1. A tilting device for tilting a crucible furnace, comprising:

a stand with supporting means for carrying the crucible furnace;

a yoke for mounting said crucible furnace to said stand and being pivotable about a shaft extending transverse to the opening of said crucible furnace;

movable guide tubes supporting said shaft and respectively mounted within upstanding members of said stand;

means for lifting said crucible and yoke;

means for releasably locking said movable guide tubes within said upstanding members whereby operation of said means for lifting causes said crucible and yoke to rotate about said shaft; and

release of said locking means causes said crucible and yoke to be lifted from said stand with operation of said lifting means and movement of said guide tubes within said upstanding members.

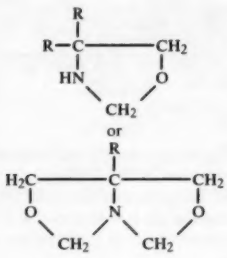
4,180,382

DURABLE PRESS FINISHING WITH OXAZOLIDINE CATALYSTS

Jerry H. Hunsucker, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jul. 1, 1977, Ser. No. 812,079
Int. Cl.[2] D06M *13/34*
U.S. Cl. 8—185 18 Claims

1. In the process of preparing wrinkle resistant textile fabrics containing cellulosic fiber wherein said fabrics are impregnated with an N-methylol durable press resin and cured, the improvement comprising adding to the durable press resin an oxazolidine or mixture of oxazolidines having the general formula



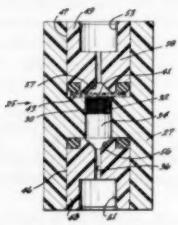
wherein R is selected from the group consisting of H, methyl, ethyl, hydroxymethyl and hydroxyethyl.

4,180,383

CHAMBER HOLDER FOR IMMOBILIZED IMMUNOADSORBENT

Lavell R. Johnson, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, E. Rutherford, N.J.

Division of Ser. No. 565,848, Apr. 7, 1975, Pat. No. 4,095,685. This application May 31, 1977, Ser. No. 801,867
Int. Cl.[2] G01N *33/16*
U.S. Cl. 422—69 14 Claims



1. A chamber holder for an immobilized immunoadsorbent wherein said chamber holder is used in a radioimmunoassay procedure for accurate determination of the amount of an antigen and wherein said chamber holder is repeatedly reused in such a procedure for subsequent assays of said antigens by show of a mixture of radioactive labelled and unlabelled antigen through said chamber holder, followed by a stoichiometric release of the portion of said mixture which is bound to said immobilized immunoadsorbent; and release of said chamber holder, comprising:

means forming a supporting structure;

means defining a chamber in said supporting structure;

an immobilized immunoadsorbent positioned within said chamber;

said immunoadsorbent including a substrate stable against dehydration and collapse;

said substrate having associated therewith antibodies for binding a specific antigen; and

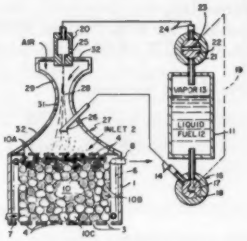
means cooperating with said chamber to support said immobilized immunoadsorbent in said chamber.

4,180,384

CATALYTIC FUEL COMBUSTION APPARATUS AND METHOD

Richard E. Rice, Arlington, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 561,591, Mar. 24, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,109
Int. Cl.[2] C10L *1/00*
U.S. Cl. 44—52 12 Claims



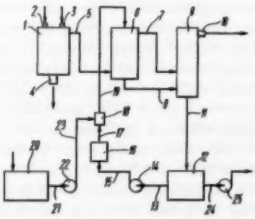
1. A fuel supply for spontaneous catalytic ignition on a platinum family catalyst, characterized by one or more pressure sustaining means containing a lower alcohol fuel plus at least one second fuel selected from the group consisting of alkanes and alkenes having less than 5 atoms or carbon, dimethyl ether and methyl ethyl ether, the supply comprising a gas volume filled predominantly with the second fuel and a liquid volume containing the major portion of the alcohol fuel, whereby the fuels may be selectively discharged from the containing means in liquid phase to initiate spontaneous combustion ignition on a platinum family catalyst or in gaseous phase for sustaining catalytic combustion.

4,180,385

FUEL COMPOSITION AND PROCESS FOR PRODUCING SAME

Vitaly I. Chikul, ulitsa Panferova, 8, kv. 170; Boris I. Tyagunov, ulitsa Panferova, 8, kv. 22, both of Moscow; Yalmar S. Ulanen, ulitsa Kuuze, 3, kv. 3; Olga S. Chikul, ulitsa Uus, 13, kv. 5, both of Estonskaya SSR, Kiviyli; Karl E. Zeger, Michurinsky prospekt, 54, korpus 3, kv. 148, Moscow; Lev Z. Tamarkin, Ulansky pereulok, 24, kv. 9, Moscow; Robert A. Petrosian, ulitsa Planernaya, 16, korpus 3, kv. 67, Moscow; Vadim E. Chmovzh, ulitsa F. Poletaeva, 19, korpus 1, kv. 194, Moscow; Alexandr S. Smirnov, Leninsky prospekt, 73/8, kv. 149, Moscow; Valentina I. Polyakovskaya, Chernomorsky bulvar, 17, korpus 2, kv. 92, Moscow, and Pavel A. Trufanov, ulitsa Piri, 9, kv. 3, Estonskaya SSR, Kiviyli, all of U.S.S.R.

Filed Nov. 30, 1976, Ser. No. 746,006
Int. Cl.[2] C10L *1/28*
U.S. Cl. 44—62 8 Claims



1. a fuel composition comprising a high-boiling petroleum

fuel and an additive consisting essentially of an ash-containing resin containing compounds of elements selected from the group consisting of Si, Ca, Mg, Al, Fe, and Mn, said additive employed in amounts sufficient to reduce the corrosive effect of said fuel upon combustion, and wherein said ash-containing resin is obtained from the thermal processing of a solid fuel.

4,180,386

HEXACOORDINATED TRANSITION METAL COMPOUNDS CONTAINING AT LEAST ONE POLYFLUOROALKYL SUBSTITUENT

William B. McCormack, and Charles A. Sandy, both of Wilmington, Del., assignors to E. I. du pont de Nemours & Company, Wilmington, Del.

Filed May 19, 1978, Ser. No. 907,875

Int. Cl.[2] C07F *15/00, 15/04, 15/06*

U.S. Cl. 44—63 **30 Claims**

1. A compound having the structure

$$(L_1)-M-(L_3)$$
$$|$$
$$(L_2)$$

wherein

M is a divalent metal selected from the group Mn, Fe, Co and Ni,

L_1 and L_2 are the same or different chelate-forming β-diketone groups having from 5 to 20 carbon atoms, one or both of L_1 and L_2 having at least one polyfluoroalkyl group, $-CF_2X$, adjacent to the carbonyl group,

X is selected from the group H, F, Cl, phenyl, C_1–C_6 alkyl and $C_nF_{2n}Y$,

n is 1 to 6,

Y is H, F, or Cl,

L_3 is a ligand having the structure, A-Z-B,

wherein

A and B are the same or different members of the group $-NH_2$, $-NHR_5$, $-NR_5R_6$, OH, OR_5, SH, SR_5 and PR_5R_6,

R_5 and R_6 are the same or different members of the group C_1 to C_4 alkyl, and

Z is a divalent hydrocarbyl group having 2 to 10 carbon atoms selected from a member of the group alkylene, phenylene and cycloalkylene, each member providing 2 or 3 carbon atoms between A and B, with the proviso that when Z is phenylene, the number of carbon atoms between A and B is 2.

4,180,387

PROCESS FOR REMOVING SLAG DURING PRESSURE GASIFICATION OF SOLID FUELS

Paul Rudolph, Bad Homburg, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

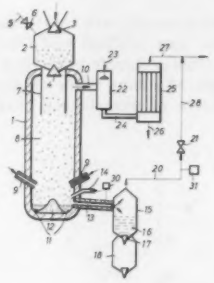
Filed Jul. 28, 1978, Ser. No. 929,137

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 2738932

Int. Cl.[2] C10J *3/08*

U.S. Cl. 48—206 **2 Claims**

1. In the pressure gasification of granular solid fossil fuel in a reactor wherein the fuel forms a fixed bed moving from top to bottom of the reactor under gravity, oxygen-containing gases and water vapor are fed as gasifying agents into the fuel bed through nozzles in the lower portion of the reactor, molten slag at a temperature of about 1350° to 1500° C. is discharged through a conduit which is inclined to the horizontal, and product gas is withdrawn from the reactor above the fuel bed, the improvement which comprises by auxiliary burner means positioned below said nozzles feeding oxygen gas separately and independently from said gasifying agents into the reactor adjacent to the inlet of the slag discharge conduit and directed from above onto the molten slag, thereby burning part of the product gas and forming a combustion gas which mixes with additional product gas to form a leakage gas at a temperature of at least about 1500° C. which leakage gas is withdrawn through the slag discharge conduit co-current with the slag into a lock chamber, the temperature of the leakage gas exceeding the temperature of the molten slag throughout the



length of the slag discharge conduit and measuring the temperature or the composition of the leakage gas in the slag discharge conduit and using the measurement for controlling the rate at which the leakage gas is withdrawn and for determining the proportion of the combustion gas from the auxillary burner in the leakage gas.

4,180,388

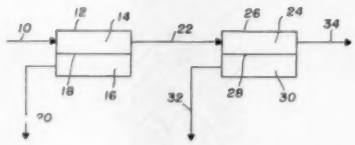
PROCESSES

Tommy E. Graham, and Donald L. MacLean, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1978, Ser. No. 888,105

Int. Cl.[2] B01D *53/22*

U.S. Cl. 55—16 **17 Claims**



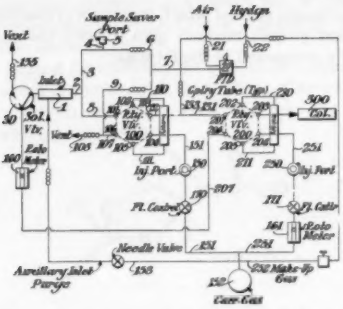
1. A process for separating at least one gas from a gaseous feed mixture containing at least one other gas comprising passing the gaseous feed mixture to at least two permeator stages in series, each permeator stage comprising a separation membrane exhibiting selectivity to the permeability of said at least one gas as compared to the permeability of said at least one other gas in the gaseous feed mixture and having a feed side and a permeate exit side in which the permeate exit side is at a lower total pressure than the total pressure on the feed side, wherein between permeator stages, the non-permeating gas from the feed side of one permeator stage is passed to the feed side of the next permeator stage; and wherein at least one permeator stage has a lower ratio of total pressure on the feed side to total pressure on the permeate exit side than the ratio of total pressure on the feed side to total pressure on the permeate exit side of at least one subsequent permeator stage, and the total pressure on said permeate exit side of said at least one subsequent permeator stage is lower than the total pressure on said permeate exit side of said at least one permeator stage.

4,180,389

ISOLATION AND CONCENTRATION OF SAMPLE PRIOR TO ANALYSIS THEREOF

Donald G. Paul, Landenberg, Pa., assignor to Envirochem Inc., Kemblesville, Pa.

Filed Nov. 13, 1978, Ser. No. 959,638
Int. Cl.[2] B01D *15/08*
U.S. Cl. 55—28 **19 Claims**



1. A method for increasing the ratio of solute to carrier gas in a gaseous stream containing a carrier gas and a sample comprising solute, which method comprises:

(a) forming a first gaseous stream comprising said sample;

(b) passing at least an aliquot portion of the first gaseous stream into a first adsorbent-containing trap and therein trapping said solute; and, thereafter

(c) simultaneously heating and backflushing said first trap with a first carrier gas to form a second gaseous stream comprising first carrier gas and the solute;

(d) passing said second gaseous stream from said first trap to a second adsorbent-containing trap and therein trapping said solute; and, thereafter

(e) simultaneously heating and backflushing said second trap with a second carrier gas to form a third gaseous stream comprising a carrier gas and said solute wherein the ratio of solute to carrier gas is greater than the ratio of solute to carrier gas in said second gaseous stream.

4,180,390

TEXTILE MACHINE INCLUDING AIR CLEANING APPARATUS

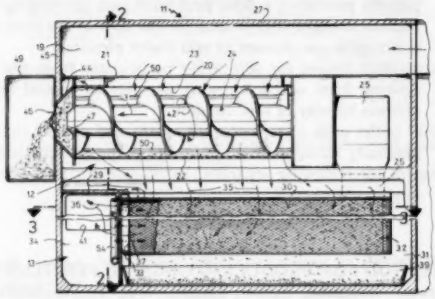
Joachim Furstenberg, Aichwald, Fed. Rep. of Germany, assignor to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 904,126
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812743
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—272 **11 Claims**

1. A textile machine having a textile processing unit in combination with air transport and cleaning means for aspirating air from a source of air for use by said textile processing unit and for thereafter cleaning said air of textile and fiber remnants as well as of airborne dust particles, said air transport and cleaning means including:

a housing,

a fiber separator including a rotatable conveyor screw rotatably supported in said housing, a filter at least partially surrounding said conveyor screw in closely spaced relationship therewith, said fiber separator being provided with stationary means for preventing co-rotation of the filtered remnants in said fiber separator with said conveyor screw, said air transport means being arranged to supply said fiber separator with dirty air containing fibers and dust, said dirty air passing across said conveyor screw and through said filter so that trapped fiber remnants are conveyed axially by said conveyor screw toward one end thereof, said fiber separator further including a flexible trap at one end of said conveyor screw, said flexible trap having a central opening which may be enlarged by the pressure of accumulating fiber remnants being transported by said conveyor screw thereby permitting said remnants to be expelled therethrough; and



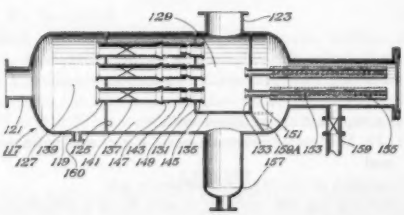
a dust separator in said housing, means in said housing for directing air from said fiber separator into said dust separator after passage through said filter, said dust separator including at least one dust filter bag for removing dust from the air, said dust separator further including means for applying periodic bursts of compressed air to said at least one dust filter bag to dislodge accumulated dust therefrom.

4,180,391

GAS PARTICULATE SEPARATOR WITH SCAVENGING GAS SEPARATION DEVICE

Marney D. Perry, Jr., Mineral Wells, Tex., and Robert A. Graff, Suwannee County, Fla., assignors to Perry Equipment Co., Mineral Wells, Tex.

Filed Jun. 13, 1977, Ser. No. 805,848
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—324 **6 Claims**



1. A separator for removing from a gas stream suspended particulates present in the gas stream, comprising:

a scavenging gas plenum defined by wall structure, said wall structure including wall means defining an outlet plenum in fluid communication with an outlet,

an inlet means for receiving gas from a gas stream,

said inlet conduit means extending into said scavenging gas plenum and having a downstream end located in said scavenging gas plenum,

gas swirl means for imparting a swirling motion to the gas entering said inlet conduit means,

conduit means axially aligned with said inlet conduit means and having an upstream end located relative to said downstream end of said inlet conduit means defining an annular ejection port in said scavenging gas plenum for the removal of suspended particulates that have separated from the gas stream due to the swirling motion imparted to the gas entering said inlet conduit means, and for the dis-

charge of a portion of the gas into said scavenging gas plenum,

said conduit means axially aligned with said inlet conduit means, having an outlet end extending from said scavenging gas plenum through said wall means to said outlet plenum,

a conduit having an outlet end extending from said scavenging gas plenum through said wall means to said outlet plenum providing a flow path from said scavenging gas plenum to said outlet plenum for the flow of gas from said scavenging gas plenum to said outlet plenum,

separation means for separating particulates from the gas flowing from said scavenging gas plenum to said outlet plenum by way of said conduit,

said outlet ends of said conduit means and of said conduit generally facing each other in said outlet plenum, and

means for removing separated particulates from said scavenging gas plenum.

4,180,392

METHOD FOR PRODUCING ORGANIC FERTILIZERS

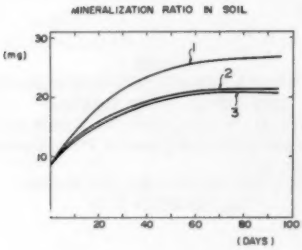
Hiroaki Ishibashi; Shizuo Tanoue, both of Minamatashi; Masakuni Kudo, Kohzushi, and Isamu Harada, Iwakunishi, all of Japan, assignors to Chisso Corporation, Osaka and Sanyo Kokusaku Pulp Co Ltd, Tokyo, both of, Japan

Filed Mar. 10, 1978, Ser. No. 885,413

Claims priority, application Japan, Mar. 24, 1977, 52-32520

Int. Cl.[2] C05F *7/00, 11/00*

U.S. Cl. 71—25 **3 Claims**



1. A method of producing organic-type fertilizer from the spent liquors of sulfite pulp, which method comprises:

(a) adjusting the solid matter concentration of said spent liquors to 20–45% by weight,

(b) reacting said spent liquor with

(1) 15–31 mols of ammonia per 1 Kg of said solid matter, and

(2 oxygen or an oxygen-containing gas

(c) carrying out the reaction of step (b) at a temperature of 90°–120° C. and under a pressure of greater than or equal to 4 Kg/cm^2 but less than 10 Kg/cm^2.

4,180,393

COMPOSITION FOR CONTROLLING PLANT GROWTH IN VITICULTURE

Fritz Amann, Ober-Ramstadt, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,458

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737454

Int. Cl.[2] A01N *11/00*

U.S. Cl. 71—78 **3 Claims**

1. The method of eliminating the wild shoots on grape vines without damaging the stems of the vines which comprises applying to the vines an aqueous solution containing a growth suppressing amount of cyanamide.

4,180,394

DERIVATIVES OF N-TRIFLUOROACETYL-N-PHOSPHONOMETHYL-GLYCINATES AND THE HERBICIDAL USE THEREOF

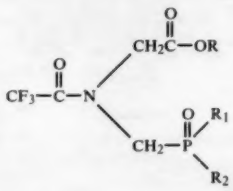
John E. Franz, Crestwood, and Robert J. Kaufman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 10, 1978, Ser. No. 922,930

Int. Cl.[2] A01N *9/36;* **C07F** *9/40, 9/44*

U.S. Cl. 71—86 **27 Claims**

19. A herbicidal method which comprises contacting a plant or the plant growth medium with a herbicidally effective amount of a compound of the formula



wherein R is alkyl of from 1 to 10 carbon atoms or chlorinated C_1–C_6 alkyl, R is a member of the group consisting of C_1–C_6 alkoxy, C_1–C_6 alkylthio, phenoxy, phenylthio, phenoxy or phenylthio substituted with one or two members of the group consisting of halo, cyano, nitro or trifluoromethyl, C_1–C_6 alkylamino, C_1–C_6 dialkylamino, morpholino and N-piperidinoamino and R_2 is a member of the group consisting of C_1–C_6 alkylthio, phenoxy, phenylthio, phenoxy or phenylthio substituted with one or two members of the group consisting of halo, cyano, nitro or trifluoromethyl, C_1–C_6 alkylamino, C_1–C_6 dialkylamino, alkenylamino, dialkenylamino, alkynylamino, dialkynylamino, wherein each alkenyl and alkynyl group contains up to six carbon atoms, morpholino and N-piperidinoamino with the proviso that R_1 and R_2 cannot represent the same group.

4,180,395

6-FLUORO-3,5-DIHALO-2-PYRIDYLOXY COMPOUNDS

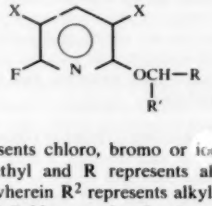
Howard Johnston, Walnut Creek, Calif., and Herman O. Senkbeil, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 765,190, Feb. 3, 1977, abandoned, which is a continuation of Ser. No. 568,339, Apr. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,010, Apr. 11, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,702

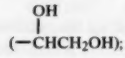
Int. Cl.[2] A01N *9/22;* **C07D** *213/89*

U.S. Cl. 71—94 **43 Claims**

1. A compound corresponding to the formula

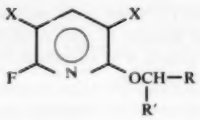


wherein X represents chloro, bromo or iodo; R′ represents hydrogen or methyl and R represents alkanoyloxymethyl ($—CH_2OCOR^2$ wherein R^2 represents alkyl of 1 to 4 carbon atoms); (2,2-dichloropropionyloxy)methyl ($—CH_2OCOC(Cl)_2CH_3$); alkoxymethyl ($—CH_2OR^2$); phenoxymethyl ($—CH_2O\phi$); (2-alkoxyethoxy) methyl ($—CH_2OCH_2CH_2OR^2$); hydroxyalkyl ($—R^3OH$ wherein R^3 represents alkylene of from 1 to 6 carbon atoms); 3-hydroxy-1-propenyl ($—CH{=}CHCH_2OH$); 1,2-dihydroxyethyl

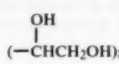


1-(2-hydroxy-ethoxy)methyl ($—CH_2—O—CH_2CH_2OH$); (2-(2-hydroxyethoxy) -ethoxy)methyl ($—CH_2OCH_2CH_2OCH_2CH_2OH$); carbamoyl ($—CONR^4R^4$ wherein each R^4 independently represents hydrogen or alkyl of 1 to 8 carbon atoms); (carboxymethyl)carbamoyl ($—CONHCH_2COOH$) or (2-hydroxyethyl)carbamoyl ($—CONR^4CH_2CH_2OH$) or (carbamoyloxy)-methyl $—CH_2OCONHR^5$ wherein R^5 is alkyl of 1 to 4 carbon atoms or phenyl).

35. A method for inhibiting the growth of undesirable plant species which comprises applying to plants, plant parts or their habitats a growth-inhibiting amount of at least one compound corresponding to the formula



wherein X represents chloro, bromo or iodo; R′ represents hydrogen or methyl and R represents alkanoyloxymethyl ($—CH_2OCOR^2$ wherein R^2 represents alkyl of 1 to 4 carbon atoms); (2,2-dichloropropionyloxy)methyl ($—CH_2OCOC(Cl)_2-CH_3$); alkoxymethyl ($—CH_2OR^2$); phenoxymethyl ($—CH_2O\phi$); (2-alkoxyethoxy)methyl ($—CH_2OCH_2CH_2OR^2$); hydroxyalkyl ($—R^3OH$ wherein R^3 represents alkylene of from 1 to 6 carbon atoms); 3-hydroxy-1-propenyl ($—CH=CHCH_2OH$); 1,2-dihydroxyethyl



1-(2-hydroxyethoxy)methyl ($—CH_2OCH_2CH_2OH$); (2-(2-hydroxyethoxy)ethoxy)methyl ($—CH_2OCH_2CH_2OCH_2CH_2OH$); carbamoyl ($—CONR^4R^4$ wherein each R^4 independently represents hydrogen or alkyl of 1 to 8 carbon atoms); (carboxymethyl)carbamoyl ($—CONHCH_2COOH$) or (2-hydroxyethyl)carbamoyl ($—CONR^4CH_2CH_2OH$) or (carbamoyloxy)methyl ($—CH_2OCONHR^5$ wherein R^5 is alkyl of 1 to 4 carbon atoms or phenyl) in admixture with an inert carrier therefor.

4,180,396

METHOD OF ALLOYING AND/OR INOCULATING AND/OR DEOXIDIZING CAST IRON MELTS PRODUCED IN A CUPOLA FURNACE

Karl-Heinz Caspers, Nüremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nüremberg, Fed. Rep. of Germany

Filed Nov. 25, 1977, Ser. No. 854,687

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653341

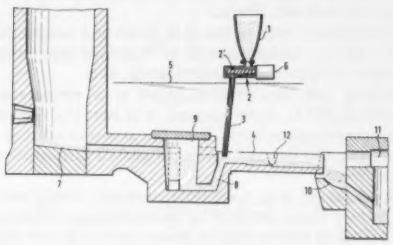
Int. Cl.² C21C *7/06*

U.S. Cl. 75—53 **5 Claims**

1. A method for use in connection with alloying, inoculating, as well as deoxidizing cast iron melts produced having an accurate composition setting in a cupola furnace arrangement having a siphon and a channel, which includes the steps of:

transferring clean molten iron from said siphon to said channel;

continuously adding controlled quantities of additive in fine granular form to the upper surface of said clean molten iron in said channel, said additive addition occurring at a rate between 0.1 and 0.6 percent by weight; and



continuously imparting a turbulence to said clean molten iron in said channel.

4,180,397

MACHINABLE STEEL

David Naylor, Rotherham, England, assignor to British Steel Corporation, London, England

Filed Sep. 12, 1978, Ser. No. 941,600

Claims priority, application United Kingdom, Sep. 15, 1977, 38550/77

Int. Cl.² C21C *7/02*

U.S. Cl. 75—58 **8 Claims**

1. A method of producing a resulphurized steel having a sulphur co.tent of between 0.05% and 0.20% by weight in the form of isolated, globular sulfide inclusions which comprises forming a melt of a steel having between 0.05% and 0.20% by weight of sulphur and adding to the melt an alkali earth metal having a high affinity for sulphur in an amount within the range of about 0.02% and 0.20% by weight to produce in the steel when solidified isolated, globular sulphide inclusions.

4,180,398

MODIFICATION OF LEADED BRASSES TO IMPROVE HOT WORKABILITY

Prakash D. Parikh, Hamden, assignor to Olin Corporation, New Haven, Conn.

Filed Jun. 22, 1978, Ser. No. 918,333

Int. Cl.² C22C *9/04*

U.S. Cl. 75—157.5 **2 Claims**

1. An alloy which exhibits high resistance to edge cracking during hot working, said alloy consisting essentially of 10 to 40% by weight zinc, 0.1 to 5% by weight lead, 0.03 to 0.75% by weight chromium, 0.005 to 0.05% by weight antimony, 0.005 to 0.05% by weight bismuth, balance copper.

4,180,399

MOLYBDENUM BASE COMPOSITE MATERIALS REINFORCED WITH CONTINUOUS SILICON CARBIDE FIBERS AND A METHOD FOR PRODUCING THE SAME

Chiaki Asada; Makoto Saito, both of Nagoya, and Hisashi Kajima, Asahi, all of Japan, assignors to The Foundation: The Research Institute for Special Inorganic Materials, Asahi, Japan

Filed Sep. 19, 1977, Ser. No. 834,341

Claims priority, application Japan, Sep. 28, 1976, 51/115378

Int. Cl.² B22F *3/00;* **C22C** *29/00*

U.S. Cl. 75—229 **4 Claims**

1. Molybdenum base composite materials reinforced with silicon carbide fibers obtained by incorporating silicon fibers containing 0.01–20% by weight of free carbon into a molybdenum base metallic matrix containing no less than 40% by weight of molybdenum as an alloy element in a volume fraction of 2–80%; and wherein the silicon carbide fibers are made by a process which comprises the following steps:

(a) preparing a spinning solution from at least one organosili-

con high molecular weight compound having a softening point of higher than 50° C., in which silicon and carbon are the main skeleton components, and spinning said spinning solution into fibers,

(b) preliminarily heating the spun fibers at a temperature of 350°–800° C. under vacuum to volatilize low molecular weight compunds contained therein, and

(c) baking the thus treated fibers at a temperature of 1,000°–2,000° C. under vacuum or at least one non-oxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas, to form silicon carbide fibers.

4. Molybdenum base composite materials reinforced with silicon carbide fibers obtained by incorporating a volume fraction of 2–80% of silicon carbide fibers containing 0.01–20% by weight of free carbon into molybdenum base alloy consisting of not less than 40% by weight of molybdenum and not more than 60% by weight in total of at least one of the following metal groups (1)–(5).

(1) 8–40% by weight of Ru or 8–55% by weight of Re,

(2) 0.02–8% by weight of Co or Ni,

(3) 0.01–5% by weight of Ti, Zr, Nb, Ta, V, Hf, or U,

(4) not more than 20% by weight of W,
not more than 10% by weight of Cr,
not more than 5% by weight of Si,
not more than 10% by weight of Mn,
not more than 1% by weight of Be,
not more than 0.5% by weight of B or
not more than 2% by weight of Cu and

(5) not more than 0.05% by weight of Al, Ca, Mg, Y or at least one of rare earth metals; and wherein the silicon carbide fibers are made by a process which comprises the following steps:

(a) subjecting polysilanes having a Si—Si bond and which have no halogen atoms to polycondensation reaction by at least one process of addition of a polycondensation catalyst, irradiation and heating to produce polycarbosilanes containing no halogen atoms,

(b) reducing the content of low molecular weight compounds contained in said polycarbosilanes by treating the above described polycarbosilanes with at least one treatment of a solvent, aging said polycarbosilanes at a temperature of 50°–700° C. and distilling said polycarbosilanes at a temperature of 100°–500° C., to produce the polycarbosilanes having a softening point of higher than 50° C.,

(c) dissolving the thus treated polycarbosilanes in a solvent or melting said polycarbosilanes to prepare spinning solution or spinning melt, and spinning said spinning solution or spinning melt into filaments, and

(d) baking the thus treated filaments at a temperature of 1,000°–2,000° C., under vacuum or at least one non-oxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas to form silicon carbide fibers.

4,180,400
COATED CEMENTED CARBIDE BODY AND METHOD OF MAKING SUCH A BODY

Ulf K. H. Smith, Huddinge; Jan N. Lindstrom, Norsborg, and Harold Mantle, Hauterive, all of Switzerland, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Jun. 6, 1978, Ser. No. 913,035

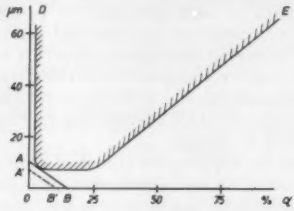
Claims priority, application Sweden, Jun. 9, 1977, 7706706

Int. Cl.[2] B22F *5/00*

U.S. Cl. 75—235 **10 Claims**

1. Sintered cemented carbide body containing at least one metal carbide and a binder metal, on which body there is applied at least one thin, wear resistant surface layer consisting essentially of aluminum oxide, characterized in that at least 85% of the aluminum oxide consists of the kappa form, the remainder if any, which mainly constitutes the alpha form, bein formed as surface portions or spots having a size of at the most 10 μm, the size and the occurrence of the surface portions being so adjusted that they lie within the area AOB in FIG. 1 of the attached drawing.

10. A method of making an aluminum-oxide coated cemented carbide body wherein a cemented carbide substrate is contacted with a gas containing an aluminum halide and a



reducing agent at high temperature, characterized in that a dopant addition of tetravalent titanium, zirconium and/or hafnium ions is added to the gas in an amount of 0.03–0.5% of the totally supplied amount of gas whereby the cemented carbide substrate is coated with aluminum oxide, at least 85% of which is in the kappa form.

4,180,401
SINTERED STEEL ALLOY

Fritz Frehn, Krefeld, Fed. Rep. of Germany, assignor to Thyssen Edelstahlwerke Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Jun. 28, 1977, Ser. No. 810,731

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630266

Int. Cl.[2] B22F *3/00;* **C22C** *29/00*

U.S. Cl. 75—236 **8 Claims**

1. A sintered steel alloy by weight consisting essentially of from 12 to 60% TiC and from 40 to 88% of steel consisting essentially of:

0 to 0.10%	C
12. to 25. %	Mo
8. to 26. %	Ni
10. to 20. %	Co
0.2 to 2. %	Ti
0 to 1.0 %	Al
0 to 2.0 %	Cu
0 to 2.0 %	Mn
0 to 0.08%	B
Remainder	Fe

4,180,402
PROCESS FOR OBTAINING HALF-TONE PICTURE OF IRREGULAR STRUCTURE

Jury S. Andreev; Olga V. Pyasetskaya, and Galina G. Leonova, all of Moscow, U.S.S.R., assignors to Vsesojuzny Gosudarstvenny Nauchno-Issiedovatelsky I Proekthyinstitut Khimo-Forograficheskoi Promyshlennosti, U.S.S.R.

Filed Nov. 28, 1977, Ser. No. 855,783

Int. Cl.[2] G03F *7/02;* **G03C** *5/30, 1/02*

U.S. Cl. 430—394 **1 Claim**

1. Method of producing a printed half-tone picture of irregular structure, which comprises exposing a coarse-grained silver halide material with an average linear size of silver halide microcrystals of 4 to 6 microns, developing the thus exposed material in an infectious lith-type developer, printing the resulting picture on a high-contrast photosensitive material, and developing the exposed high-contrast photosensitive material, thereby obtaining a high quality half tone picture with the optical densities of the original being highly reproducible.

4,180,403
PHOTOHARDENABLE FILMS HAVING HIGH RESOLUTION CONTAINING NITROSO DIMERS

George R. Nacci, Wilmington, and José F. Pazos, Claymont, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 697,947, Jun. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,228, Feb. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 423,989, Dec. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,877, Jan. 18, 1973, abandoned. This application Dec. 7, 1977, Ser. No. 858,350

Int. Cl.[2] G03C 1/68

U.S. Cl. 430—281 11 Claims

1. A photohardenable film consisting essentially of:

(a) a substantially solid organic composition comprising an addition-polymerizable, nongaseous ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chain-propagating addition polymerization, and a macromolecular organic polymeric binder,

(b) 0.04–3% by weight, based on the total film material, of solvent-soluble nitroso dimer which is a noninhibitor of free-radical polymerization but dissociates to nitroso monomer which is an inhibitor of free-radical polymerization, contains a dinitroso group, and is characterized by a dissociation constant of 10^{-2}–10^{-10} in solution at 25° C. and a rate of dissociation having a half-life of at least 0.5 minute in solution at 25° C., and

(c) 1.0–10% by weight, based on the total film material, of an organic, radiation-sensitive free-radical generating system based on a 2,4,5-triarylimidazolyl dimer and a free-radical producing electron doner system, with the proviso that the weight ratio of nitroso dimer to free-radical generating system is no greater than 2:1, said free-radical generating system being proportioned to give said film at its particular thickness a mean optical density of 0.02–1.25 to radiation in the spectral region in which the free-radical generating system absorbs radiation.

4,180,404
HEAT RESISTANT PHOTORESIST COMPOSITION AND PROCESS FOR PREPARING THE SAME

Kaoru Ohmura; Ichiro Shibasaki; Takeo Kimura, and Muneaki Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1978, Ser. No. 961,534

Claims priority, application Japan, Nov. 17, 1977, 52-137256; Dec. 28, 1977, 52-157481

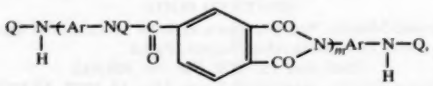
Int. Cl.[2] G03C 1/72; C08G 18/00

U.S. Cl. 430—284 6 Claims

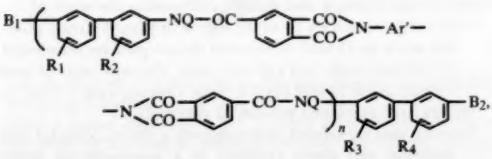
1. A heat resistant photoresist composition comprising:

(1) 100 parts by weight of a polymer selected from the group consisting of

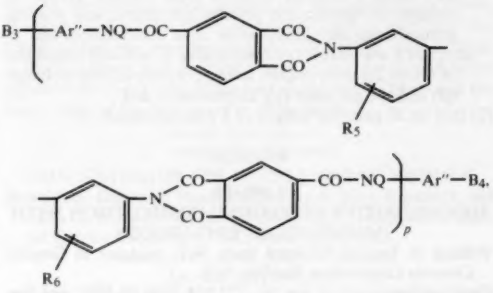
a polymer (α) of the general formula



a polymer (β) of the general formula



a polymer (γ) of the general formula

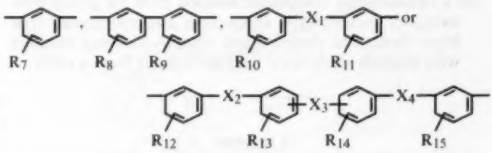


and mixtures thereof

wherein

R_1 to R_6 are the same or different and each represent a hydrogen atom, a (C_1–C_4) alkyl group or a halogen atom,

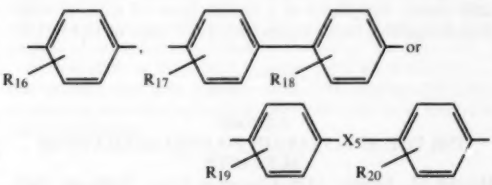
Ar represents



wherein

R_7 to R_{15} are the same or different and each have the same meaning as defined with respect to R_1 to R_6 and X_1 to X_4 are the same or different and each represent —O—, —SO_2—, —CH_2—, —CO—, —COO—, —$C(CH_3)_2$—, —S— or —$(CH_2)_2$—,

Ar′ represents



wherein

R_{16} to R_{20} are the same or different and each have the same meaning as defined with respect to R_1 to R_6 and X_5 has the same meaning as defined with respect to X_1 to X_4,

Ar″ has the same meaning as defined with respect to Ar or Ar′,

B_1 to B_4 are the same or different and each represent —NCO or a substituent (A) formed by the reaction of —NCO with cinnamic acid or cinnamyl alcohol,

Q represents a hydrogen atom and a substituent (A′), provided that each of the rates of substituent introduction into the molecules of the polymers (α), (β) and (γ) as defined by the formulae

$$\frac{\text{number of substituent } (A') \text{ in the molecule}}{m+2} \times 100,$$

$$\frac{\text{number of substituents } (A) + (A') \text{ in the molecule}}{2 \times n + 2} \times 100 \text{ and}$$

$$\frac{\text{number of substituents } (A) + (A') \text{ in the molecule}}{2 \times p + 2} \times 100$$

with respect to the polymer (α), the polymer (β) and the polymer (γ), respectively, is 0.1 to 50%, said substituent (A') being a member selected from residual groups of cinnamoyl chloride and glycidyl cinnamate, said residual groups being introduced alone or in combination, and

m, n and p are integers corresponding to reduced viscosities of 0.1 to 2.0 with respect to the polymer (α) the polymer (β) and the polymer (γ), respectively; and

(2) 0.01 to 20 parts by weight of a photosensitizer.

4,180,405

HEAT-SENSITIVE RECORDING COMPOSITION WITH MIXED COLOR PRECURSORS

William R. Lawton, Orchard Park, N.Y., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 772,084, Feb. 25, 1977, and Ser. No. 774,210, Mar. 7, 1977. This application Mar. 4, 1977, Ser. No. 774,385

Int. Cl.² C09K *3/00*

U.S. Cl. 106—14.5 **12 Claims**

1. A mixture of heat-sensitive color precursors comprising

(a) a cyclic polyketo compound reactive with amines and amides at elevated temperatures to form a color; and

(b) a chromogenic compound selected from the group consisting of lactone type leuco dyes and spiropyran type leuco dyes, said chromogenic compound being reactive with phenols at elevated temperatures to form a color.

4,180,406

POST TREATING ZINC SURFACES

Yasushi Miyazaki, Ichikawa; Masanori Suzuki, and Hideaki Kaneko, both of Tokyo, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Jul. 22, 1977, Ser. No. 818,259

Int. Cl.² C09D *5/08*

U.S. Cl. 106—14.15 **12 Claims**

1. An aqueous composition useful in the post-treatment of zinc or zinc alloy surfaces having a zinc phosphate conversion coating thereon comprising a thiourea compound and a vegetable tannin compound in a weight ratio of thiourea compound:vegetable tannin compound in the range of 10:1 to 1:10.

4,180,407

INK FOR APPLICATION TO UNGLAZED PAPER SURFACES

Donald M. Gibson, 1175 Clarendon Cres., Oakland, Calif. 94610, and Donald C. Pierce, 59 Reposa Vista, Novato, Calif. 94947

Continuation of Ser. No. 783,500, Mar. 28, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,824

Int. Cl.² C09D *11/20, 11/14, 11/08, 11/04*

U.S. Cl. 106—26 **15 Claims**

1. An ink for ruling pens for direct use on unglazed paper surface including cardboard picture mats, consisting essentially of the following components:

(a) from 2.8 to 13.7% by weight of opaque water-insoluble pigment of particles passing through a 325 mesh sieve and said particles being of from 0.1 to 5.0 micron size in at least one dimension,

(b) from 2.5 to 4% by weight of an organic binder, adapted to bind said particles together and to said surfaces and to form a flexible film upon drying,

(c) a small but effective amount of a surfactant sufficient to effect wetting of the pigment by water and dispersion therein,

(d) a small but effective amount of fungicide sufficient to prevent bacterial degradation of said organic binder, and

(e) water to make 100% by weight and to form said ink having a surface tension of from 50 to 60 dynes per cm, to provide an opaque ink,

(f) the viscosity of said ink being adjusted so that the pigment holds in said pen while the ink is being used; and the surface tension and viscosity being so adjusted as to determine the rheological properties of said ink so that an adequate charge of said ink will hold in the pen without dripping out while the ink will flow out of said pen readily when a line is being drawn; and said ink will not spread and feather out when applied to a porous paper surface.

4,180,408

POLYVALENT METAL SALTS OF OXIDIZED AND AMIDIFIED WAXES

Joseph O. Bienvenu, and Ashvinkumar N. Jagtap, both of Longview, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 6, 1978, Ser. No. 875,358

Int. Cl.² C09D *11/12, 11/06*

U.S. Cl. 106—31 **21 Claims**

1. A polyvalent metal salt of an oxidized and amidified non-benzenoid hydrocarbon wax obtained by the process consisting essentially of the steps of (b) oxidizing a non-benzenoid hydrocarbon wax (a), (c) thereafter amidifying the oxidized wax of step (b) with ammonia or an amine containing amino hydrogen and an additional isocyanate reactible active hydrogen, and finally (d) forming a polyvalent metal salt of the previously amidified product of step (c).

4,180,409

THERMALLY STABLE QUARTZ GLASS

Manfred Mansmann, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 702,835, Jul. 6, 1976, Pat. No. 4,104,045. This application Mar. 16, 1978, Ser. No. 887,683

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530808

Int. Cl.² C03C *13/00, 3/22, 3/04*

U.S. Cl. 106—39.6 **10 Claims**

1. Homogeneous quartz glass fibers containing at least one of chromium and manganese in about 0.05 to 20% by weight of the SiO_2 expressed as Cr_2O_3 and Mn_2O_3, and no more than traces of alkali and alkaline earth metal oxides, the glass being stable up to about 1400° C. with a controlled tendency toward cristobalite formation up to an average crystallite size of about 100 to 500 Å.

4,180,410

METHOD FOR PRODUCING A SILICON NITRIDE BASE SINTERED BODY

Hideyuki Masaki, Nagoya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed May 15, 1978, Ser. No. 905,912

Claims priority, application Japan, May 14, 1977, 52-55705

Int. Cl.² C04B *35/58*

U.S. Cl. 106—73.2 **24 Claims**

1. A method for producing a silicon nitride base sintered body of high strength and density comprising the steps of

combining essentially 65 to 96 mol % of silicon nitride powder and 4 to 35 mol % of metal oxides powder composed of yttrium oxide and cerium oxide, the mol ratio of said yttrium oxide to said cerium oxide ranging from 3:7 to 7:3,

mixing said combined powdered materials,

forming said powdered materials into a green compact and sintering said green compact in a non-oxidizing atmosphere without applying pressure.

4,180,411

MICROCRYSTALLINE CELLULOSE AS EXTRUSION AID/COMBUSTIBLE FILLER FOR ALUMINA

Robert H. Whitman, and William A. Barber, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 815,341, Jul. 13, 1977, Pat. No. 4,119,474. This application Jul. 28, 1978, Ser. No. 929,150

Int. Cl.[2] C04B *21/06, 35/10*

U.S. Cl. 106—41 **7 Claims**

1. A method for preparing a low-density alumina substrate comprising mixing 60–90 percent by weight of a rehydratable alumina with 10–40 percent by weight of microcrystalline cellulose with sufficient water to yield a 45 to 70 percent solids mixture, extruding the mixture, curing the resultant extrudates, and calcining the extrudates at a temperature of from 1700° to 2000° F.

4,180,412

METHOD FOR MANUFACTURING GLUE FOR A BINDING AGENT IN MANUFACTURE OF CHIPBOARD OR OTHER CELLULOSE PRODUCTS

C. Karl Bunnig, Am Denkmal 9, 3252 Bad Münder 1, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,684

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715501

Int. Cl.[2] C08L *89/00*

U.S. Cl. 106—124 **6 Claims**

1. A method for manufacturing a glue from physico-chemically changed animal blood or physico-chemically changed blood components, for use as binding agent for manufacturing cellulose-containing chipboard or panels covered with wood veneer, comprising the steps of: adding to whole blood a substance inhibiting coagulation; adding for acidification a single additive in the form of a monobasic organic acid in an amount resulting in a pH value between 3.0 and 4.0 and wetting of said blood components, said second step immediately preceding mixing of said glue with cellulose-containing particles, and optimizing the mixing ratio of blood solids to said additive.

4,180,413

ICE HOCKEY STICK

David A. Diederich, Chaska, Minn., assignor to The Northland Group, Inc., Chaska, Minn.

Division of Ser. No. 742,017, Nov. 15, 1976, Pat. No. 4,134,587. This application Jun. 12, 1978, Ser. No. 914,427

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—185 **14 Claims**

1. A method of making an ice hockey stick having a handle including a body and sheet members and blade having opposite sides, a lower edge and a heel portion comprising: attaching the blade to the handle, shaping the blade and handle, attaching elongated sheet members having elongated fibers with all of the fibers oriented along the length of the sheet members to opposite sides of the body, attaching a first reinforcing fabric with plastic resin to opposite sides of the blade, wrapping a second reinforcing fabric around the first reinforcing fabric, the blade, and at least the lower edge of the heel portion of the blade, said plastic resin bonding the sides of the second fabric to the first fabric, and applying a wear strip to the second fabric adjacent the lower edge of the heel portion of the blade and the lower edge of the heel portion of the blade.

4,180,414

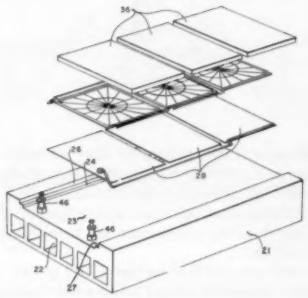
CONCENTRATOR SOLAR CELL ARRAY MODULE

Ronald M. Diamond, Shadow Hills; Ku S. Ling, Glendora, and Allen G. Winterer, La Habra, all of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jul. 10, 1978, Ser. No. 923,091

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **8 Claims**



1. In a concentrator solar cell array module, a metallic substrate serving as a heat sink and having a planar mounting surface, a semiconductor spacer having opposed front and back surfaces with an insulating layer formed on said back surface, a thermally conductive adhesive for securing said spacer to said mounting surface of said substrate with the insulating layer of the spacer facing the mounting surface, a semiconductor solar cell having top and bottom sides, solder connecting said bottom side of the solar cell and said front surface of the spacer, and leads connected to the solar cell.

3. A module as in claim 1 wherein there are a plurality of spacers and solar cells together with U-shaped braided wires connecting said solar cells to connect the same in an electrical series connection.

4,180,415

HOT-JUNCTION ELECTRODE MEMBERS FOR COPPER/SILVER CHALCOGENIDES

Edward F. Hampl, Jr., Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

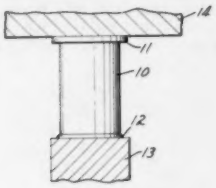
Continuation of Ser. No. 526,598, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 321,222, Jan. 5, 1973, Pat. No. 3,853,632, which is a continuation of Ser. No. 635,948, Apr. 20, 1967, abandoned, which is a continuation-in-part of Ser. No. 463,148, Jun. 11, 1965, abandoned, and a continuation-in-part of Ser. No. 242,219, Apr. 7, 1972, Pat. No. 3,852,118, which is a continuation of Ser. No. 36,145, May 11, 1970, abandoned, and a continuation-in-part of Ser. No. 291,938, Sep. 25, 1972, Pat. No. 3,873,370. This application Aug. 29, 1977, Ser. No. 828,567 No. 828,567

Int. Cl.[2] H01L *35/16, 35/04*

U.S. Cl. 136—205 **2 Claims**

1. In a thermoelectric generator that includes at least a length of thermoelectric leg consisting essentially of metal ingredients selected from copper and silver and chalcogen ingredients selected from selenium and tellurium; the ingredi-

ents of said length of thermoelectric leg being within the following proportions:
for tellurium compositions,
(a) 32.5 atomic percent ≦ tellurium ≦ 33.7 atomic percent
(b) 27 atomic percent ≦ copper ≦ 67 atomic percent
(c) 0 atomic percent < silver ≦ 40 atomic percent
for selenium compositions,
(a) 32.5 atomic percent ≦ selenium ≦ 33.7 atomic percent
(b) 60 atomic percent ≦ copper ≦ 67 atomic percent
(c) 0 atomic percent < silver ≦ 7 atomic percent; and
a member that engages the hot end of said length of thermoelectric leg to make electrical and thermal contact with said length of leg and consists essentially of electrically conductive metal which comprises at least 50 weight-percent tungsten and in addition rhenium.



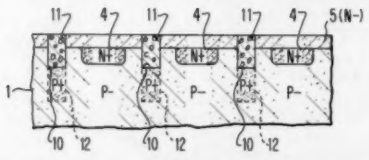
2. In a thermoelectric generator that includes at least a length of thermoelectric leg consisting essentially of metal ingredients selected from copper and silver and chalcogen ingredients selected from selenium and tellurium; the ingredients of said length of thermoelectric leg being within the following proportions:
(a) 32.5 atomic percent ≦ tellurium ≦ 33.7 atomic percent
(b) 27 atomic percent ≦ copper ≦ 67 atomic percent
(c) 0 atomic percent < silver ≦ 40 atomic percent
for selenium compositions,
(a) 32.5 atomic pressure ≦ selenium ≦ 33.7 atomic percent
(b) 60 atomic percent ≦ copper ≦ 67 atomic percent
(c) 0 atomic percent < silver ≦ 7 atomic percent; and
a member that engages the hot end of said length of thermoelectric leg to make electrical and thermal contact with said length of leg and consists essentially of tungsten.

4,180,416

THERMAL MIGRATION-POROUS SILICON TECHNIQUE FOR FORMING DEEP DIELECTRIC ISOLATION

Geoffrey E. Brock, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1978, Ser. No. 946,007
Int. Cl.[2] H01L 21/228; C25F 3/00
U.S. Cl. 148—1.5 **13 Claims**



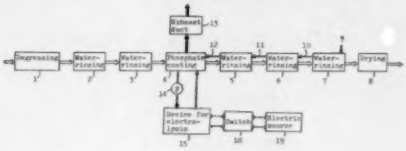
1. The method for forming dielectric isolation comprising:
providing a body of monocrystalline silicon semiconductor,
depositing metal on the surface of said body in a desired pattern of isolation regions for the said monocrystalline silicon body,
heating the body and the deposited metal to form a melt of a metal-rich semiconductor material therein,
migrating each melt of metal-rich semiconductor material as a molten zone into said body of semiconductor material to form regions having substantially uniform impurity concentration of a type determined by the impurity type of said metal,
converting at least a portion of said regions into a porous silicon substance by anodic treatment, and providing an atmosphere to convert said porous silicon substance into a dielectric isolating material.

4,180,417

PHOSPHATING OF METALLIC SUBSTRATE

Shoji Oka, Ando; Ryoichi Murakami, Osaka, and Akiko Sueyoshi, Onodai, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Oct. 12, 1978, Ser. No. 950,620
Claims priority, application Japan, Oct. 12, 1977, 52-122856
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.[2] C23F 7/10
U.S. Cl. 148—6.15 Z **13 Claims**



1. In a method for phosphating the surface of a metallic substrate by treatment with a phosphating solution comprising nitrite ions and nitrate ions in an aqueous acidic medium, the improvement wherein the supply of the nitrite ions to the phosphating solution is carried out by electrolytic reduction of the nitrate ions therein by passing a direct current between an electrode as the cathode and an electrode as the anode dipped in the phosphating solution while changing the direction of the current flow at an interval of from 10 seconds to 30 minutes.

4,180,418

METHOD OF MAKING A STEEL WIRE ADAPTED FOR COLD DRAWING

Hans Paulitsch, Salzgitter-Lebenstedt; Alfred Babilon, Salzgitter; Gerhard Kiefer; Kurt Koerfer, both of Salzgitter-Lebenstedt; Constantin Vlad, Wolfenbüttel, and Ullrich Koch, Salzgitter-Lebenstedt, all of Fed. Rep. of Germany, assignors to Stahlwerke Peine-Salzgitter A.G., Peine, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 683,783, May 6, 1976, abandoned, which is a continuation of Ser. No. 503,815, Sep. 6, 1974, abandoned. This application Sep. 1, 1977, Ser. No. 829,815
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1973, 2345738
Int. Cl.[2] C21D 9/52
U.S. Cl. 148—12.4 **11 Claims**

1. A process of making a steel wire of high strength and good cold drawing properties, the said process comprising
(a) after hot rolling the wire bringing it to a temperature between about 850° and 910° C. so as to obtain a fine grain austenite structure in the wire;
(b) thereafter quenching the wire to cool it to a temperature of about 500° C.;
(c) coiling the wire after said quench and finally cooling it to room temperature,
the said quench being carried out in a manner that a transformation to martensite occurs which is limited to the outer surface of the wire not to exceed 33 percent of the cross sectional area of the wire,
the still substantially higher temperature of the core after the quench causing a substantially isothermal transformation of the austenite of the core to pearlite with only a small

fraction of ferrite and further causing a tempering of the martensite surface portion,

whereby a product with a martensite outer surface of the said maximum diameter and an inner core of pearlite is obtained having a temper gradient from the surface to the core.

4,180,419

SOLDER FLUX

Floyd A. Thompson, Jr., North Carver, Mass., assignor to M. W. Dunton Company, Providence, R.I.

Filed May 23, 1978, Ser. No. 908,702

Int. Cl.[2] B23K *35/34*

U.S. Cl. 148—23 **22 Claims**

1. A composition of fluxing agent with a water soluble carrier wherein the fluxing agent consists essentially of a phosphoric ester which is the reaction product of stochiometric amounts of phosphoric acid and a polyhydric alcohol, the alcohol having a molecular weight of about 200.

4,180,420

RAZOR BLADES

Suri A. Sastri, Stow, and Ben H. Alexander, Weston, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Dec. 1, 1977, Ser. No. 856,732

Int. Cl.[2] C22C *38/22*

U.S. Cl. 148—37 **2 Claims**

1. A martensitic stainless steel razor blade; said blade comprising 0.30% to 0.45% carbon; 11% to 16% chromium; 0 to 2.5% molybdenum; 0 to 4% tungsten; 0 to 0.70% silicon; 0 to 1.5% manganese, and the balance iron with incidental impurities and said blade having a fine carbide microstructure comprising about 200 to 500 carbides per 100 square microns.

4,180,421

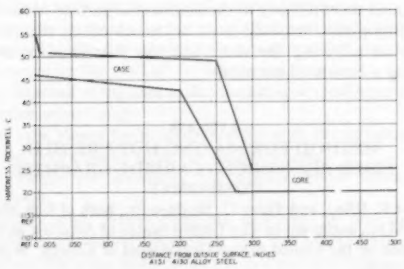
TORSION BAR AND METHOD OF FORMING THE SAME

George L. Joseph, Morgan Hill, Calif., and Charles A. Brolin, Cedar Rapids, Iowa, assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 863,558, Dec. 22, 1977, Pat. No. 4,131,491. This application Sep. 21, 1978, Ser. No. 944,421

Int. Cl.[2] C21D *9/28, 9/30*

U.S. Cl. 148—150 **10 Claims**



1. A method of forming a torsion bar or the like having an outer case and a core from a steel alloy bar of the desired size and shape and with a medium carbon content, or from a steel bar having similar hardenability characteristics; comprising the steps of through hardening the bar to a predetermined hardness of about Rockwell C 30 to C 40, case hardening the bar for transforming austenite in the case into martensite which expands inducing a high compressive stress near the surface of the bar with the compressive stresses diminishing radially inward to the center of the bar, and retaining the core at a temperature below the transformation temperature for resisting expansion of both the case and the core and for inducing hoop and axial compressive stresses and radial tensile stresses in the case.

4,180,422

METHOD OF MAKING SEMICONDUCTOR DIODES

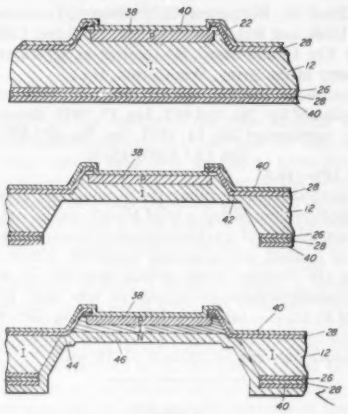
Warren C. Rosvold, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 255,284, May 19, 1972, abandoned, which is a division of Ser. No. 86,960, Nov. 4, 1970, Pat. No. 3,746,587, which is a continuation of Ser. No. 795,977, Feb. 3, 1969, abandoned. This application Dec. 6, 1973, Ser. No. 422,396

The portion of the term of this patent subsequent to Jan. 21, 1986, has been disclaimed.

Int. Cl.[2] H01L *21/306, 21/76*

U.S. Cl. 148—175 **15 Claims**



1. The method of forming a semiconductor structure comprising the steps of:

(a) etching into a surface of a layer of silicon material, such surface lying in a <100> crystallographic plane of such material, to form walls in such material with sides parallel to a <111> crystallographic plane of such material;

(b) forming a layer of insulating material over the walls; and,

(c) forming a layer of conductive material over the layer of insulating material.

4,180,423

METHOD OF MANUFACTURING RED LIGHT-EMITTING GALLIUM PHOSPHIDE DEVICE

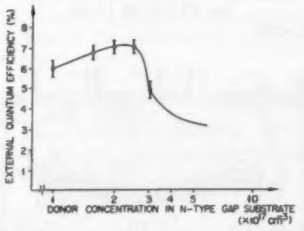
Makoto Naito, Kamakura, and Akinobu Kasami, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 514,747, Oct. 15, 1974, abandoned. This application Aug. 24, 1976, Ser. No. 717,505

Claims priority, application Japan, Jan. 31, 1974, 49-12218; Jan. 31, 1974, 49-12219

Int. Cl.[2] H01L *33/00*

U.S. Cl. 148—171 **4 Claims**



1. A method of manufacturing a red light-emitting gallium phosphide device comprising the steps of forming by liquid phase epitaxial growth an n-type gallium phosphide layer whose donor concentration at the p-n junction ranges between 2×10^{17} cm^{-3} and 5.5×10^{17} cm^{-3} on an n-type gallium phos-

phide substrate whose donor concentration ranges between 1×10^{17} cm^{-3} and 3×10^{17} cm^{-3}: and forming by liquid phase epitaxial growth of a cooling rate ranging between 0.2° and 3° C./min. a p-type gallium phosphide layer whose net acceptor concentration ranges between 1×10^{17} cm^{-3} and 3×10^{17} cm^{-3} in the portion at a distance of not more than 20 microns from the p-n junction.

4,180,424

CONTROL OF BURNING RATE AND BURNING RATE EXPONENT BY PARTICLE SIZE IN GUN PROPELLANTS

Russell Reed, Jr., Ridgecrest, Calif.; John A. Peterson, Brigham City, Utah, and Raymond M. Price, Hollister, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 668,455, Mar. 17, 1976, which is a continuation of Ser. No. 324,451, Jan. 17, 1973, abandoned. This application Jul. 11, 1977, Ser. No. 814,574

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.4 **7 Claims**

1. A method for controlling the burning rate exponent of a gun propellent comprising a solid binder and an oxidizer consisting essentially of cyclotetramethylenetetranitramine and devoid of coolant and inorganic oxidizers, which comprises reducing the average mean particle diameter of at least the cyclotetramethylenetetranitramine to less than 60 microns sufficient to provide said propellant a burning rate exponent n, as defined by the equation $R=ap^n$, between about 0.9 and 1.3 at a pressure between 10,000 and 50,000 psi.

4,180,425

GELATINE EXPLOSIVE COMPOSITIONS

Bidhan C. Ghosh; Gopal M. Chopra, and Soumendra N. Sen, all of Bihar, India, assignors to Indian Explosives Limited, Bengal, India

Filed Jul. 21, 1978, Ser. No. 926,610

Int. Cl.² C06B *25/30*

U.S. Cl. 149—95 **16 Claims**

1. In a gelatin explosive composition with a marked reduction in the quantities of liquid nitric esters and blasting soluble nitrocotton content, comprising mixtures of liquid nitric esters, blasting soluble nitrocotton, oxidizing salts and fuels, the improved gelatin explosive composition containing at least one dispersing agent.

4,180,426

PROCESS AND APPARATUS FOR MAKING MULTIPLY SHEETS

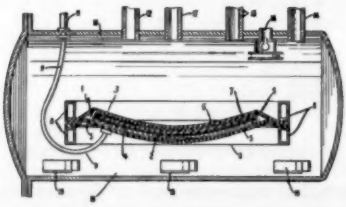
Georges Oustin, and Helmut Krumm, both of Aix-la-Chapelle, Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 10,911, Feb. 12, 1970, abandoned. This application Jul. 11, 1974, Ser. No. 487,618

Claims priority, application France, Feb. 17, 1969, 69.03831

Int. Cl.² B32B *17/04*

U.S. Cl. 156—104 **1 Claim**



1. A method of making a multi-ply sheet which comprises assembling an interlayer of thermoplastic adhesive between superposed plies of the sheet to form an assembly, enclosing the assembly within a porous cover, enclosing the assembly and cover within a gas-impermeable flexible sack, enclosing the assembly-and-cover-containing sack within an evacuable container, reducing the gas pressures within said sack and said container to subatmospheric levels while maintaining the pressure level within the container less than the pressure level in the sack, thereafter increasing the temperature and pressure within said container while maintaining a subatmospheric pressure within said sack to seal the edges of said assembly, and thereafter further increasing the pressure in said container above atmospheric pressure and producing a temperature therein to bond said interlayer to the adjacent plies of said assembly.

4,180,427

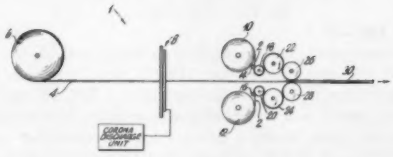
FOAMED THERMOPLASTIC MATERIAL LAMINATED WITH A SHEET-LIKE COVERING MATERIAL

Paul J. Bertsch, Riverdale, N.J., assignor to Primex Plastics Co., Oakland, N.J.

Filed Dec. 16, 1977, Ser. No. 861,562

Int. Cl.² B29C *19/02*; B65C *9/25*; B29H *7/20*

U.S. Cl. 156—272 **12 Claims**



1. A process for laminating a sheet of covering material onto a surface of a layer of foamed thermoplastic material comprising the steps of cooling and aging for at least 24 hours the layer of foamed thermoplastic material, moving the layer of cooled and aged foamed thermoplastic material along a path of travel, bombarding the surface to receive the sheet of covering material as it moves along the path of travel with a continuous plasma of ionized particles for burning away impurities on the surface and breaking up the film of residual monomer thereon, heating the sheet of covering material to a temperature above the melting point of the thermoplastic material, and applying the heated sheet directly to the bombarded surface of the layer of thermoplastic material as it continues along the path of travel for adhering the sheet and the foamed material and forming a laminated member.

4,180,428

METHOD FOR MAKING HOT-PRESSED FIBER-REINFORCED CARBIDE-GRAPHITE COMPOSITE

Robert E. Riley, and Terry C. Wallace Sr., both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 23, 1978, Ser. No. 918,258

Int. Cl.² B32B *31/12*; C01B *31/30*

U.S. Cl. 156—281 **5 Claims**

1. An improved method for making a hot pressed, fiber-reinforced carbide-graphite composite being 15 to 40 volume percent Ta carbide, said improvement comprising:

(a) contacting multiple layers of filaments of a graphite cloth with a gas having the following range of composition by volume percent

(I) 0.5 to 5.0-tantalum pentachloride

(II) 0 to 25-hydrogen chloride (gas)

(III) 50 to 95-hydrogen and

(IV) 0 to 50-inert gas,

(b) the said gas reacting with the filaments to form a coating,

said coating being formed in a temperature range of 650° to 900° C.,

(c) at a pressure of 0.01 to 0.3 atmosphere,

(d) the coating time dependent on the amount of Ta carbide formed in the composite, and then,

(e) hot pressing multiple layers of filaments at a temperature of about 3000° C., a pressure of about 3000 psi, for a period of about 10 minutes.

4,180,429

APPARATUS FOR MANUFACTURING THIN-WALLED PLASTIC HOSES

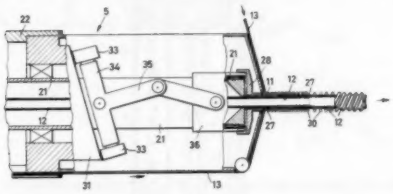
Tassilo Alber, Steinbach, Fed. Rep. of Germany, assignor to Vohran Kunststofferzeugnisse GmbH, Steinbach, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,388

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700056

Int. Cl.² B31C *13/00*

U.S. Cl. 156—425 **13 Claims**



1. An apparatus for continuously manufacturing thin-walled flexible hoses having helical reinforcement members which are relatively strong in relation to the hose walls comprising:

supply means for continuously supplying and advancing a hose core along a predetermined path;

means for supplying compressed gas to the interior of said hose core to create an internal pressure therein;

counterpressure means containing compressed gas disposed along said path for substantially equalizing the pressure difference on the wall of the advancing hose core;

means disposed along said path for coiling a reinforcement member comprising:

fixed tube means for passing therethrough the advancing hose core coming from the supply means;

reel means for mounting the reinforcement member thereon;

a hollow shaft means rotatably mounted on said tube means for rotatably mounting said reel means; and

means for driving said reel means and said shaft means to pay out and coil said reinforcement member;

fixed guide means disposed at the exit of said fixed tube means and the coiling point of said cooling means for guiding the reinforcement member to the hose core, said guide means projecting with an axial length corresponding to the thickness of several turns of the reinforcement member beyond the coiling point such that a plurality of said turns are accumulated along the external surface of said guide means; and

ram means for applying an intermittent pressure in an axial direction against the respective last turn of said plurality for axially displacing said turns of the reinforcement member on the guide means to successively supply the first turn thereon to the surface of said hose core.

4,180,430

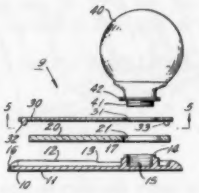
ENVELOPE SEALING DEVICE

Charles S. Gelman, 1477 E. 10th St., Brooklyn, N.Y. 11230

Filed Jan. 17, 1979, Ser. No. 4,033

Int. Cl.² B29H *9/00;* **B05C** *11/00*

U.S. Cl. 156—441.5 **4 Claims**



1. An envelope sealing device of the type adapted to be moved across an unsealed envelope to moisten the flap of the envelope and then moved back over the flap to press the flap into sealing engagement with the remainder of the envelope consisting of a moistening pad and three assembled parts,

a first of said parts being a base portion having curvilinear shape, a smooth uninterrupted bottom, a peripheral rim extending upwardly from the bottom providing a thin chamber adapted to hold a moistening pad, a threaded tubular projection extending upwardly from said chamber and containing a small orifice connecting the interior of said tubular projection to the thin chamber, said peripheral rim being connected to the periphery of the bottom by a smooth convex curvilinear surface and said rim containing two opposed smoothly curved depressions therein,

said moistening pad having a shape and thickness approximately matching the shape and depth of the thin chamber formed by the rim of the first part and containing an opening therein adapted to fit over the threaded tubular projection in said chamber,

the second of said parts consisting of a cover means adapted to fit over and cover the moistening pad, said cover means containing an opening adapted to fit over the projecting tubular portion to aid in positioning the cover over the moistening pad, said cover also containing a downwardly extending arcuate bead in the area between the two opposed depressions of said rim where the cover is in place over the pad, said cover also containing a downwardly extending stud in the area opposite the bead to limit rotation of the cover with respect to the tubular projection in one direction when the cover is not pressed against said pad,

said third part comprising a decorative outer surface with an internal hollow chamber and a threaded tubular projecting portion adapted to match the threads of said projection from the base, said hollow chamber being closed except for the opening to said tubular projection, said chamber part being adapted to press against said cover part when screwed onto said tubular projection, the length of said tubular projection being adjusted and arranged so as to leave the orifice in said tubular projection open to the hollow chamber.

4,180,431

TAPE SPLICING DEVICE

Anthony L. Gelardi, Box 127, Cape Porpoise, Me. 04104

Filed Jan. 10, 1979, Ser. No. 2,468

Int. Cl.² B31F *5/00*

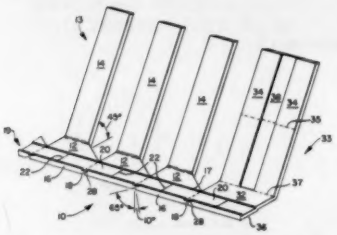
U.S. Cl. 156—505 **10 Claims**

1. A tape splicing device comprising:

an elongated bar member having as a part thereof means for positioning and supporting abutting ends of a tape to be spliced, and

said elongated bar member also having as a part thereof at least two detachable splice sticks each with a head portion

having and supporting a short section of splicing tape thereon and a handle portion for use in manipulating the



head portion to apply the short section of splicing tape to the ends of recording tape to be spliced.

4,180,432

PROCESS FOR ETCHING SiO_2 LAYERS TO SILICON I A MODERATE VACUUM GAS PLASMA

Harold A. Clark, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,796
Int. Cl.[2] B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 **4 Claims**

1. A process for etching a layer of silicon dioxide in contact with silicon comprising forming a silicon nitride mask on the surface of the silicon dioxide, said mask having apertures through which the silicon dioxide layer is etched, and exposing the silicon dioxide to a gas plasma formed from a mixture of CF_4 and oxygen, wherein the mixture comprises above about 5 to about 15 percent by volume of CF_4 and the remainder oxygen, to etch the silicon dioxide down to the silicon surface.

4,180,433

PRODUCTION OF IMPROVED CHRYSOTILE ASBESTOS FIBRES

Roger W. Glass, Oakville, and Richard A. Kuntze, Mississauga, both of Canada, assignors to Ontario Research Foundation, Sheridan Park, Canada

Continuation-in-part of Ser. No. 682,854, May 3, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,929
Int. Cl.[2] D21B *1/02*
U.S. Cl. 162—3 **11 Claims**

1. A method for the production of chrysotile asbestos fibres having improved filtration properties in asbestos-cement uses, which comprises heating chrysotile asbestos fibres selected from Group 4 and Group 5 chrysotile asbestos fibres having a filtration rate in asbestos cement uses of about 11 to about 12 ml/sec in an ambient atmosphere having a substantially uniform temperature of about 400° to about 600° C. for a time from about 1 to about 5 hours sufficient to increase the filtration rate of said fibres in asbestos cement uses to at least about 19 ml/sec and insufficient to result in a loss of water of crystallization of the fibres of greater than about 2% by weight of the total weight of water of crystallization in the fibres, whereby said improved filtration properties are obtained without any significant overall fibre strength loss.

4,180,434

MICA PAPER CONTAINING CELLULOSE

Jean A. Ciani, Valdoie, France; Ernst Diehl, and Berno Haberthür, both of Breitenbach, Switzerland, assignors to Schweizerische Isola-Werke, Breitenbach, Switzerland

Continuation-in-part of Ser. No. 652,781, Jan. 27, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 862,272
Int. Cl.[2] D21H *3/66*
U.S. Cl. 162—138 **4 Claims**

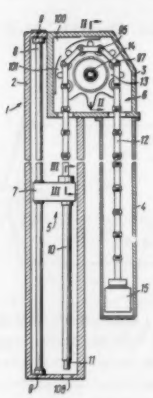
1. An electrically insulating mica paper containing cellulose, but no binding agent and having a tensile strength and a porosity higher than those of pure mica paper, the tensile strength being sufficiently high for the mica paper to be processed without a backing, characterized in that the mica paper contains (i) at least about 50% by weight of platelets of natural mica produced without using chemicals other than water, said mica platelets having diameters in the range of 0.025 to 1 mm and a thickness in the range of 1,000–30,000 Angstrom units and (ii) about 10 to 50% by weight of cellulose fibres, said mica paper has an impregnatability according to ASTM 202-73 in the range of about 35 to 50 seconds, and a porosity according to Bekk in the range of about 6 to 15 seconds per 10 milliliters.

4,180,435

REFUELLING MACHINE FOR NUCLEAR REACTOR

Evgeny P. Shumyakin, ulitsa Petra Smorodina, 8, kv. 58; Konstantin I. Sabir-de-Ribas, Piskarevsky prospekt, 39, kv. 256; Isaak A. Druzhinsky, Moskovsky prospekt, 184, kv. 12; Gennady P. Shishov, ulitsa Kurchatova, 4, kv. 89, and Boris I. Andreichikov, Chkalovsky prospekt, 36, kv. 27, all of Leningrad, U.S.S.R.

Filed May 25, 1977, Ser. No. 800,289
Int. Cl.[2] G21C *19/20;* B66C *17/08*
U.S. Cl. 176—30 **20 Claims**



1. A manipulating means of a refuelling machine for a nuclear reactor having fuel assemblies in its core, comprising:

walls defining a sealed housing;

a gripping means for applying forces to a fuel assembly to be handled, having an end face and arranged in said housing:

a drive coupled to said gripping means for transmitting force thereto, said drive comprising an electromotor having an output shaft, a driving member coupled to said output shaft, a sprocket kinematically coupled to said driving member, an axle installed in the walls of said sealed housing with a predetermined amount of radial clearance between the walls and the axle and having first and second ends extending from said sealed housing, said sprocket being mounted on said axle, a chain in contact with said sprocket and having a first end and second end, the chain carrying said gripping means at its second end, a counterweight attached to the first end of said chain;

means for regulating forces applied to said gripping means comprising a first force sensing transducer mounted on said sealed housing and having a sensitive element connected to the first of the two ends of said axle extending outside said sealed housing, said first force sensing transducer sensing translatory movement of said first end, a second force sensing transducer mounted on said sealed housing and having a sensitive element connected to the second of the two ends of said axle extending outside said sealed housing, said second force sensing transducer sensing translatory movement of said second end, and circuit means responsive to said first and second force sensing

transducers for controlling said electromotor so that forces applied to said gripping means by said drive and forces applied by said gripping means on said fuel assembly are controlled; and

a spring suspension member installed in said gripping means for absorbing a predetermined amount of force applied by said drive to said gripping means when the fuel assembly being handled encounters an obstacle to its movement.

4,180,436

ANTIBACTERIAL COMPOUNDS AND PROCESS FOR PRODUCTION THEREOF

Gakuzo Tamura, and Kenichi Shimizu, both of Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

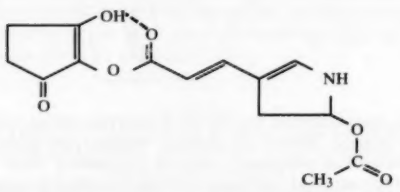
Filed Feb. 17, 1978, Ser. No. 878,776

Claims priority, application Japan, Feb. 18, 1977, 52-16068

Int. Cl.[2] L12D *9/00*

U.S. Cl. 435—119 **2 Claims**

1. A process for producing compound S551-II represented by the formula



which comprises culturing a microorganism having the identifying characteristics of *Streptomyces griseorubiginosus* FERM-P No. 3836, NRRL 11,268 in a nutrient medium until said compound is accumulated in the culture liquor and recovering said compound from said culture liquor.

4,180,437

PURIFICATION OF ANTISERUM FOR THROMBOSIS TEST

Désiré J. Collen, Winksele, Belgium, assignor to Leuven Research & Development V.Z.W., Leuven, Belgium

Filed Mar. 1, 1977, Ser. No. 773,308

Claims priority, application Netherlands, Mar. 8, 1976, 7602422

Int. Cl.[2] C07G *7/00*; G01N *31/00, 31/14*

U.S. Cl. 435—7 **14 Claims**

1. A method for purifying an antiserum which has been generated against an enzyme-inhibitor-complex, said complex being part of the activated blood-coagulation-or fibrinolytic system in bloodplasma, comprising the steps of:

(a) immunoprecipitating a freshly generated antiserum with fresh human bloodplasma and thereby forming a precipitate and a remaining fluid; and

(b) subjecting the said remaining fluid to chromatographic separation over an insolubilized enzyme-inhibitor-complex, said complex corresponding to the enzyme-inhibitor-complex against which the antiserum has been generated, in order to separate a purified antiserum from said remaining fluid.

4,180,438

PROCESS FOR THE PREPARATION OF SUMP PRODUCT

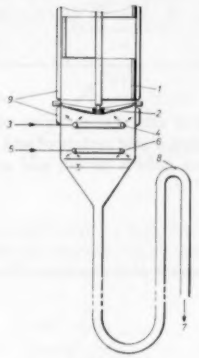
Hans-Walter Brandt, Odenthal; Ludwig Deibele, Cologne; Kurt Toepffer, and Karl-Heinz Steinacker, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 596,706, Jul. 17, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 724,052

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1974, 2438290

Int. Cl.[2] B01D *1/22*

U.S. Cl. 203—89 **7 Claims**



1. In the distillation of a solution comprising an organic substance, and non-volatile material which is precipitated as solid in the distillation, in a thin layer evaporator, comprising the steps of distilling the solution in the thin layer evaporator to evaporate the organic substance as overhead distillate product of the distillation and precipitate the non-volatile material as solids, collecting the precipitated solids as sump products, and adding a solvent which is at a lower temperature than the walls of the evaporator to the sump to take up the precipitated solids and removing the solvent containing the solids from the sump, the improvement which comprises introducing the solvent from outside the evaporator directly into the sump and providing a vapor lock adjacent to and above the level of the introduction of the solvent by injecting a stream of inert vapor through a first spray ring obliquely and upwardly and opposite the direction of the solvent to prevent condensation of distillate vapors by the solvent.

4,180,439

ANODIC ETCHING METHOD FOR THE DETECTION OF ELECTRICALLY ACTIVE DEFECTS IN SILICON

John L. Deines, Pleasant Valley; Michael R. Poponiak, Newburgh, and Robert O. Schwenker, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 667,232, Mar. 15, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,476

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**

1. The method comprising

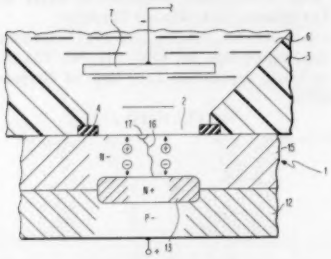
providing an N^- type silicon wafer containing active device regions of known depth below a surface of said wafer,

mounting said wafer on an electrically conductive member so as to expose said surface of said wafer, and to cover the entire opposite surface of said wafer,

contacting said surface of said wafer with a hydrofluoric acid solution of concentration less than about 15%,

applying a potential difference between said solution and said member making said solution negative with respect to said member, and

setting the amplitude of said potential difference solely in accordance with the desired depth of the depletion region created thereby so that said depletion region is created below said surface of said wafer having a depth no greater



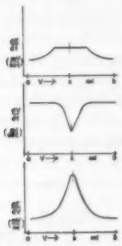
than said depth of said active device regions, whereby etch pits are formed in said surface of said wafer overlying electrically active defects within said active device regions.

4,180,440

VARIABLE ENDPOINT ANALYZER

Dennis A. Gibboney, Mt. Pleasant; John T. Schneider, Apollo, and Jerry C. Premus, Scottdale, all of Pa., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed May 15, 1978, Ser. No. 905,572
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—1 T **19 Claims**



1. In the method of potentiometrically titrating a sample to an unknown endpoint or endpoints including: delivering a titrant to the sample until an endpoint or endpoints are reached; continuously monitoring the volume of the titrant delivered to the sample; and continuously monitoring the potential of the sample during titration, the improvement comprising accurately determining said endpoint or endpoints by the steps of:

(a) generating a first signal proportional to the rate of change with respect to time in sample potential during titration;

(b) generating a second signal proportional to the titrant delivery rate with respect to time during titration;

(c) dividing said first signal by said second signal to produce a third signal proportional to the change in potential with respect to the change in volume; and

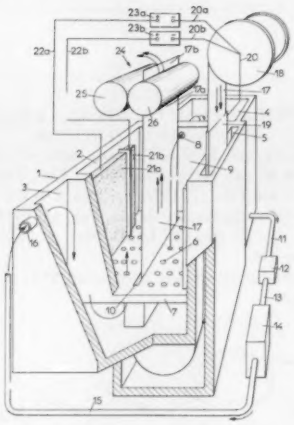
(d) monitoring said third signal to identify a signal corresponding to said endpoint or endpoints.

4,180,441

PROCESS FOR MAKING NEGATIVE ELECTRODES FOR ELECTROCHEMICAL GENERATORS, AND THE NEGATIVE ELECTRODES THUS OBTAINED

Bernard Stiker, Paris, and Fernand Jolas, Rueil Malmaison, both of France, assignors to Societe les Piles Wonder, France

Filed May 23, 1978, Ser. No. 908,783
Claims priority, application France, May 24, 1977, 77 15843
Int. Cl.[2] C25C 5/02, 1/16
U.S. Cl. 204—2.1 **7 Claims**



1. A manufacturing process for a material coated with an active material deposit for making negative electrodes for electrochemical generators, wherein a powdery layer relatively little adherent and fragile is being deposited on a continuous metallic tape by passing said metallic tape continuously, negatively polarized, through an electrolytic bath containing ions of the active metal to be deposited, the bath being disposed in an electrolysis vat containing an electrode of said active metal, and said powdery layer being consolidated by subjecting said tape coated with a powdery layer, at the outlet of said bath, to a calendering operation, characterized in that there is provided a laminar flow of the bath in the whole area of the vat comprising said tape and the electrode which is positively polarized, and by the fact that said vat comprises also a non-active metal electrode which is also positively polarized, the ratio between the anodic current at the active metal electrode and the total anodic current applied to the two electrodes being substantially equal to the electrodeposition efficiency of the active metal of the tape in the vat.

4,180,442

ELECTRODEPOSITION OF COATINGS ON METALS TO ENHANCE ADHESIVE BONDING

Norman R. Byrd, Villa Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 14, 1978, Ser. No. 915,319
Int. Cl.[2] C25D 9/04, 9/06
U.S. Cl. 204—14 N **32 Claims**

1. A process for enhancing adhesive bonding of a metal substrate and permitting spot welding thereof, which comprises passing an electric current through a non-aqueous electrolyte in which a metal substrate is the anode, the metal of said substrate being active and capable of forming an organometallic compound, said electrolyte containing an organic compound selected from the classes consisting of (a) carboxyl substituted aminosilanes, (b) butylamine reaction products with phthalic anhydride, decylamine reaction products with phthalic anhydride, and carboxyl terminated butadiene-acrylonitrile copolymer, and (c) phenyl phosphonic acid, and

dimethyl phosphite, as their triethylamine salts, and sulfonic acid compounds.

4,180,443

METHOD FOR COLORING ALUMINUM

George R. Darrow, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 920,057, Jun. 28, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 972,928
Int. Cl.[2] C25D 11/22
U.S. Cl. 204—35 N 13 Claims

1. In a process for electrolytically coloring articles of aluminum or aluminum alloys, wherein an alternating current is passed between an electrode system comprising a previously anodized aluminum article and a counterelectrode immersed in an acidic bath containing salts of metals capable of coloring the anodized layer, the improvement which comprises,

anodizing said aluminum article prior to coloring in an aqueous acid electrolyte comprising from about 12–24 weight percent sulfuric acid, and from 1–4% by volume of a polyhydric alcohol of from 3 to 6 carbon atoms and 1–4% by volume of an organic carboxylic acid containing at least one reactive group in the alpha-position wherein said reactive group is a hydroxy, amino, keto or carboxyl group, and carrying out the anodizing at a temperature of from 65°–85° F. at a current density of from 24–36 amperes/sq. ft., so as to obtain an anodized layer of from about 0.6 to 1.1 mils.

4,180,444

ELECTROLYTIC METHODS EMPLOYING GRAPHITIC CARBON CATHODES AND INORGANIC COMPLEXES PRODUCED THEREBY

George G. Merkl, Haworth, N.J., assignor to Merkl Technology, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 795,979, May 11, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 896,372
Int. Cl.[2] C25B 1/00
U.S. Cl. 204—90 24 Claims

1. An electrolytic method for producing water-soluble inorganic complexes containing graphitic carbon which comprises passing an electric current between

(a) a graphitic carbon cathode; and

(b) a sacrificial graphite carbon anode, the current being passed through

(c) an electrolyte comprising an aqueous solution of a compound capable of reduction or hydrogenation to a hydride species at the graphitic carbon cathode,

whereby said compound is converted to a hydride species at the graphitic carbon cathode and the hydride species reacts with the sacrificial graphitic carbon anode to form the water-soluble, inorganic complex containing graphitic carbon.

4,180,445

OXYGEN SELECTIVE ANODE

John E. Bennett, and Joseph E. Elliott, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Mar. 27, 1978, Ser. No. 890,374
Int. Cl.[2] C25B 1/02, 11/16
U.S. Cl. 204—129 4 Claims

1. A method of electrolysis comprising passing an electric current through an aqueous electrolyte containing chloride ions between an anode and a cathode whereby oxygen gas is formed at the anode and the cation is reacted at the cathode along with the evolution of hydrogen gas, the anode comprising an electrically conductive substrate bearing on at least a portion of the surface thereof an amorphous manganese dioxide coating.

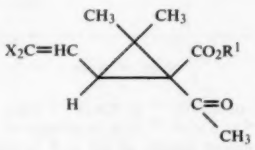
4,180,446

METHOD OF PREPARING DIHALOGEN VINYL CYCLOPROPANECARBOXYLIC ACID ESTERS

Hans-Georg Schmidt, Niederkassel, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

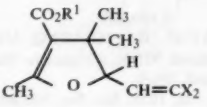
Filed Aug. 28, 1978, Ser. No. 937,622
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740479; Mar. 23, 1978, 2812672; Mar. 23, 1978, 2812673; Jun. 9, 1978, 2825363
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—158 R 8 Claims

1. A method of preparing a dihalogn vinyl cyclopropane carboxylic acid ester of the formula



I

wherein R^1 is a straight-chain or branched alkyl radical and X represents chlorine or bromine which comprises subjecting a dihalogen vinyl dihydrofuran of the formula



II

wherein R^1 and X have the meanings given above to exposure to ultraviolet light or light having an ultraviolet content.

4,180,447

PROCESS FOR THE PRODUCTION OF HARD PLASTIC FOAMS USING A POLYVINYLCHLORIDE BASE

Drago Sencar, Steinhausen, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 758,131, Jan. 10, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,208
Int. Cl.[2] C08F 8/00
U.S. Cl. 204—159.17 11 Claims

1. A process for the production of hard plastic foam, using a polyvinylchloride base, from a mixture of polyvinylchloride, at least one temporary softener and at least one expansion agent, wherein the mixture is heated, cooled and expanded, the improvement consisting of using at least one polymerizable ethylenically unsaturated monomer having at least one double linkage as a softener and conducting the polymerization of said polymerizable monomer, after completion of the expansions, by means of ionizing rays, the dosage of the ionizing rays being between 3 and 15 megarads.

4,180,448

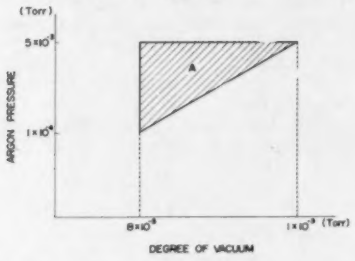
PROCESS FOR PREPARATION OF PLASTIC MOLDED ARTICLES HAVING METAL FILM

Yoshikazu Soshiki; Hiroshi Sugiura, both of Okazaki; Kouzi Onizawa, Anjyo; Toshikatsu Togawa, Aichi; Minoru Kojima, Inuyama; Tsukio Morikawa, Aichi; Naohiko Kurimoto, Yokohama, and Hiromitu Katou, Kasugai, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo; Sakae Riken Kogyo Co., Ltd., Aichi and Dai Nippon Toryo Co., Ltd., Osaka, all of, Japan

Filed Dec. 13, 1978, Ser. No. 969,000
Claims priority, application Japan, May 22, 1978, 53-61194
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 C 6 Claims

1. A process for the preparation of plastic molded articles

having a metal film, which comprises the steps of (a) coating an ultraviolet-curing acrylic resin undercoating paint on the surface of a plastic molded article and irradiating the coated surface with ultraviolet rays to form a base coat layer, (b) forming on the base coat layer a metal film of chromium or stainless steel by the sputtering process under conditions of a



degree of vacuum of 6×10^{-5} to 1×10^{-3} Torr, an argon pressure of 1×10^{-4} to 5×10^{-3} Torr, a voltage of 200 to 600 V and a cathode current density of 0.2 to 5 A/dm^2, and (c) coating on the metal film a top coating paint comprising as main components an acryl polyol having an OH value of 10 to 200 and an acid value of 1 to 12 and a non-yellowing polyisocyanate and curing the coated paint to form a top coat layer.

4,180,449

BONDED ASBESTOS DIAPHRAGMS AND MATS

Henrik R. Heikel, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 18, 1978, Ser. No. 943,020
Int. Cl.[2] C25B *13/00, 13/06, 13/08*
U.S. Cl. 204—296 **30 Claims**

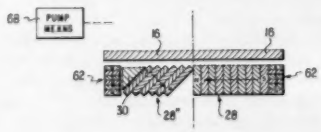
1. A porous, fibrous asbestos-containing mat characterized by having the asbestos fibers bonded to one another by the pyrolysis products of a hydrolyzed organic titanate.

4,180,450

PLANAR MAGNETRON SPUTTERING DEVICE

Charles F. Morrison, Jr., Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 935,358, Aug. 21, 1978. This application Sep. 27, 1978, Ser. No. 946,370
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **30 Claims**



1. In a planar magnetron sputtering device including a cathode of target material having a planar sputtering surface, at least a portion of which is disposed about a center line perpendicular to said surface, an anode adapted for establishing an accelerating electric field between said anode and cathode, and magnetic means for establishing a magnetic field adjacent the planar sputtering surface of said cathode for lengthening the path traveled by electrons removed from said cathode, and wherein the lines of force of the magnetic field extend over the sputtering surface of said cathode and pass through the cathode in the vicinity of said center line,

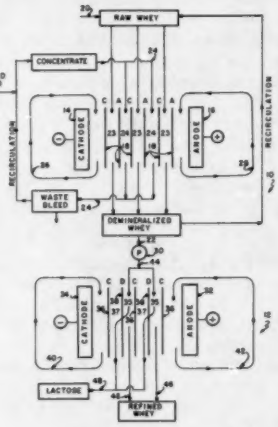
the improvement where said magnetic means includes first magnet means for causing a majority of said magnetic lines of force to pass through said cathode in the vicinity of said center line at angles of 45° or less with respect to said planar surface to thereby enhance the uniformity of cathode erosion and where said magnetic means includes further magnet means for causing the magnetic lines of force to be substantially perpendicular to said sputtering surface of the cathode at the approximate periphery thereof.

4,180,451

APPARATUS FOR TREATING WHEY

Wayne A. McRae, Pelham, N.H., assignor to Ionics Inc., Watertown, Mass.

Division of Ser. No. 897,834, Apr. 19, 1978, Pat. No. 4,146,455. This application Jan. 2, 1979, Ser. No. 454
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—301 **3 Claims**



1. Apparatus for the treatment of liquids comprising an electrodialysis membrane cell for desalting said liquid having substantially alternating desalting and concentrating chambers in combination with a forced flow electrophoresis membrane cell having substantially alternating feed and permeate chambers with conduit means for passing the said resulting desalted liquid from said electrodialysis cell into the said feed chambers of said electrophoresis cell while said desalted liquid is under hydraulic pressure means.

4,180,452

METHOD FOR HYDROGENATION OF COAL

Jerry E. Sinor, Longmont, Colo., assignor to Cameron Engineers, Inc., Denver, Colo.

Filed Aug. 22, 1977, Ser. No. 826,731
Int. Cl.[2] C10G *1/04, 1/08*
U.S. Cl. 208—8 LE **8 Claims**

1. A method for hydrogenating coal comprising the steps of:

pulverizing and drying the coal;

saturating the dried, pulverized coal with methanol;

slurrying the methanol saturated coal in benzene to form a coal-benzene slurry;

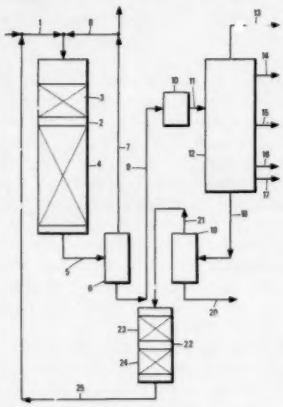
exposing the coal-benzene slurry to microwave energy for a period of time sufficient to effect hydrogenation of the coal; and

collecting and separating the hydrogenation products.

4,180,453
PROCESS FOR THE STEAM-CRACKING OF HEAVY FEEDSTOCKS

Jean-Pierre Franck, Bougival; Edouard Freund; Jean-François Le Page, both of Rueil Malmaison, and Jean Miquel, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 10, 1978, Ser. No. 876,825
Claims priority, application France, Feb. 11, 1977, 77 04151
Int. Cl.[2] C10G *37/00*
U.S. Cl. 208—57 **5 Claims**



1. A process for treating a hydrocarbon charge of initial boiling point higher than about 150° C., selected from the atmospheric gas oils, vacuum gas oils and deasphalted residues, the charge containing at least 10% by weight selected from monocyclic and polycyclic aromatic hydrocarbons, comprising the steps of:

(a) passing a mixture of said hydrocarbon charge with a recycle fraction as hereinafter defined through a catalyst bed in the presence of hydrogen to hydrogenate olefins present in said mixture, at a temperature between 280° and 400° C., said temperature being lower than the hydrotreating of step (b), said catalyst bed containing at least one sulfide of a metal from group VI B and at least one sulfide of a metal from group VIII of the periodic classification of the elements, and a carrier having an acidity corresponding to a heat of ammonia absorption lower than $\Delta H = 0.06$, measured at a pressure of 10^{-4} mm Hg;

(b) subjecting resultant effluent from step (a) to a hydrotreatment to separate nitrogen and sulfur and to hydrogenate the monocyclic and polycyclic aromatic hydrocarbons therein, at 340°–420° C., in the presence of hydrogen gas and a catalyst comprising 1–30% by weight of at least one sulfide of a metal selected from tungsten and molybdenum, and at least one sulfide of a metal selected from cobalt and nickel, and an acidic carrier selected from aluminas, alumina-silicas, boron-aluminas, fluorinated aluminas and magnesia-silicas;

(c) subjecting at least a portion of resultant effluent from the hydrotreatment of step (b) to a steam-cracking step;

(d) withdrawing from the steam-cracking step a gas oil fraction distilling at about 150°–400° C., light hydrocarbons and a gasoline fraction;

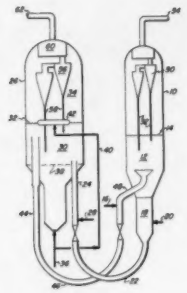
(e) subjecting at least a portion of said gas oil fraction from step (d) to hydrogenation at 150°–260° C. under a pressure of 30 to 130 bars, at a L.H.S.V. of from 1 to 5, in the presence of a catalyst selected from a platinum group metal or at least one sulfided metal from group VI B and VIII of the periodic classification of elements, and a carrier selected from the group consisting of alumina and silica having a specific surface of between 10 and 100 m^2/g, said hydrogenation effecting a decrease of the total content of alkenylaromatic hydrocarbons and indenes in said gas oil fraction to less than 1% by weight; and

(f) admixing resultant effluent from step (e) as said recycle fraction with said hydrocarbon charge to form said mixture which is passed through said catalyst bed of step (a), the amount of said admixed recycle fraction being at least 10% by weight of said hydrocarbon charge.

4,180,454
METHOD FOR COMBUSTING CARBON MONOXIDE IN A FLUID CATALYTIC CRACKING PROCESS

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1978, Ser. No. 866,497
Int. Cl.[2] C10G *11/04*; B01J *8/24, 23/94*
U.S. Cl. 208—113 **7 Claims**



1. In a fluidized catalytic cracking process which comprises contacting a hydrocarbon feedstock with a cracking catalyst in a reaction zone under cracking conditions to produce cracked hydrocarbon vapors and coke contaminated catalyst, wherein said coke contaminated catalyst is regenerated in a regeneration zone under regeneration conditions by contact with an oxygen-containing regeneration gas thereby forming a regenerated catalyst and a flue gas containing carbon monoxide, the catalyst in the regeneration zone being fluidized by the upward flow of said regeneration gas to form a dense phase catalyst bed and a dilute catalyst phase which are separated by an interface, the improvement which comprises passing a portion of said regeneration gas into a gas distribution means located at about the interface between said dense phase catalyst bed and said dilute catalyst phase to thereby combust at about the interface at least a portion of the carbon monoxide in said flue gas.

4,180,455
PROCESS FOR THERMAL CRACKING A HEAVY HYDROCARBON

William Taciuk, Calgary, Canada, assignor to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Division of Ser. No. 828,119, Sep. 26, 1977. This application Dec. 23, 1977, Ser. No. 864,087
Int. Cl.[2] C10G *9/20*
U.S. Cl. 208—126 **1 Claim**

1. A process for upgrading heavy hydrocarbons, such process employing direct thermal treatment effected in an apparatus having horizontal, concentric, radially spaced inner and outer rotatable tubes in which one axial end is the feed end and the opposite axial end is the product end, said inner tube forming an open cylindrical vapor zone, said tubes forming between them an open annular space having a combustion zone, comprising:

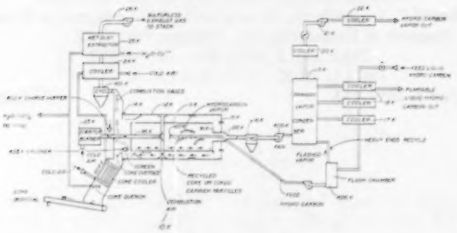
continuously advancing hot particulate solids through the inner tube from the feed end to the product end and back through the annular space;

spraying the hydrocarbons as a liquid into the vapor zone onto the hot solids;

cascading and mixing the solids and hydrocarbons as they advance through the vapor zone to achieve beneficial heat transfer and thereby vaporize hydrocarbons and form carbon on the solids;

removing by suction the hydrocarbon vapors produced in the inner tube;

transferring carbon-coated solids from the product end of the inner tube into the combustion zone in the annular space;



cascading and repeatedly raising and dropping the carbon-coated solids in the combustion zone while introducing oxygen-containing gas thereinto to burn at least part of the carbon and heat the remainder of the solids;

transferring burned hot solids from the feed end of the annular space into the feed end of the inner tube;

removing by suction vapors produced in the combustion zone; and

maintaining seals against gaseous flow between the combustion zone and the vapor zone by a combination of maintaining substantially equal pressures in said zones and blocking gaseous flow with the solids being transferred.

4,180,456

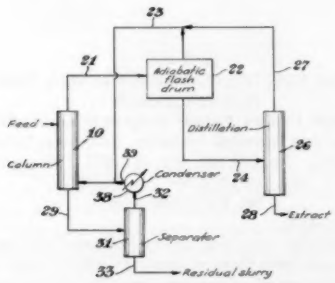
PROCESS FOR RECOVERING A PREMIUM OIL FROM A SLURRY PRODUCED BY HIGH TEMPERATURE HYDROGENATION OF A SOLID, HYDROCARBONACEOUS FUEL

Norman G. Moll, Sanford, and George J. Quarderer, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 809,958, Jun. 27, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,674

Int. Cl.[2] C10G *21/14*

U.S. Cl. 208—177 **7 Claims**



1. An improved process for separating a feed slurry produced by high temperature hydrogenation of a solid hydrocarbonaceous fuel and comprising fine solids, polar liquids and premium liquid oil, into a first fraction comprising the premium liquid oil and a second fraction comprising the fine solids and polar liquids, the process comprising:

(a) contacting the feed slurry with a nonpolar liquid solvent selected from the group consisting of (1) C_5–C_9 aliphatic hydrocarbon, (2) C_5–C_9 alicyclic hydrocarbon and (3) naphthenic or paraffinic fraction of a coal liquefaction product containing less than about 10 weight percent aromatic compounds, said contacting conducted in a vertical column defining an upper settling zone, a contacting zone and a lower collection zone, that portion of the column defining the collection zone having a column wall which is at a temperature at least about 20° C. above the temperature of the column wall defining said contacting zone the settling and contacting zones being operated at a temperature between about 100° C. and about 250° C. and at a pressure sufficient to maintain both the feed slurry and solvent in a liquid state but less than about 450 psi, the feed slurry being introduced into the column at or near the top of the contacting zone and the solvent introduced into the column at or near the bottom of the contacting zone, the solvent and feed slurry being contacted at a solvent:slurry weight ratio of at least about 0.5:1 and contacted in such a manner that the solvent:

(1) passes up and through the column while the feed slurry passes down and through the column;

(2) is in intimate contact with the feed slurry as they simultaneously pass through the column; and

(3) extracts from the feed slurry as they simultaneously pass through the column the premium liquid oil;

(b) recovering from the settling zone of the column as an overflow said first fraction; and

(c) recovering from the collection zone of the column as a viscous slurry underflow said second fraction.

4,180,457

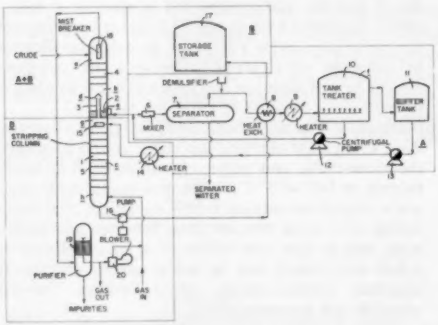
PROCESS FOR DESALTING AND DEHYDRATION OF CRUDE OIL INCLUDING HOT WATER WASHING AND GAS STRIPPING

Valer V. Popp; Ion Suditu; Petre Neagu, all of Cimpina; Leonida Fotescu, Ploiesti; Ion Mihalache, Bucharest, and Dumitru Tirboiu, Cimpina, all of Romania, assignors to Trustul Petrolului Bolintin, Comuna Bolintin din Vale, Romania

Filed Jan. 17, 1978, Ser. No. 870,105

Int. Cl.[2] C10G *33/04, 31/08*

U.S. Cl. 208—188 **2 Claims**



1. A process for desalting and dehydrating a crude oil, comprising the steps of:

(a) washing crude oil obtained from the upper compartment of a stripping column, as hereinafter delineated, with hot water containing a demulsifier thereby producing a mixture of the crude oil and the hot water containing said demulsifier;

(b) separating free water from the mixture produced in step (a) to thereby leave a washed crude oil;

(c) adding to said washed crude oil from step (b) an optimum quantity of a demulsifier and thereafter heating the washed crude oil containing the demulsifier;

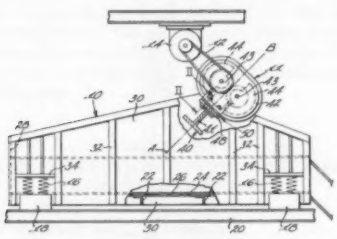
(d) settling the heated washed crude oil containing demulsifier and water and separating said water therefrom to leave a treated crude oil and produce water containing demulsifier;
(e) recirculating the water-containing demulsifier from step (d) to step (a);
(f) stripping the treated crude oil of step (d) with a gas to remove volatile hydrocarbons and water in vapor phase from said treated crude oil in countercurrent contact with said gas in a lower portion of a stripping column, thereby recovering crude oil which is stored;
(g) passing the stripping gas containing volatile components and water vapor from the lower portion of said column through an upper compartment of said column to condense the volatile components and the water vapor in said gas by contacting said stripping gas with crude oil prior to passing said oil to washing step (a);
(h) recovering cold stripping gas from step (g); and
(i) recirculating to step (f) at least a portion of the recovered cold stripping gas of step (h) to said lower portion of said column.

4,180,458

VIBRATORY SCREEN HAVING NOISE LEVEL REDUCTION BY ISOLATION

James E. Shahan, Bolingbrook, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 16, 1979, Ser. No. 12,883
Int. Cl.[2] B07B *1/42*
U.S. Cl. 209—326 **8 Claims**



1. A vibrating screen comprising, in combination, a screen body for moving particulate material and being mounted for vibratory movement, rotatable eccentric mass drive means for vibrating said screen body at a substantially constant frequency which is substantially higher than the natural vibration frequency of said screen body and means for resiliently mounting said drive means on said screen body so that vibratory forces emanating at approximately the fundamental component of said constant frequency from said drive means are transmitted unrestrained to said screen body and vibratory forces which are at harmonics of the fundamental component of said constant frequency are substantially attenuated, said mounting means constituting substantially the sole connection between said drive means and said screen body and the natural vibratory frequency of said resilient mounting means being approximately equal to said constant frequency divided by $\sqrt{2}$.

4,180,459

PROCESS OF MAKING AGRICULTURAL PRODUCT FROM ORGANIC SEWAGE SLUDGE

James F. Zievers, LaGrange, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Dec. 16, 1977, Ser. No. 861,292
Int. Cl.[2] C02C *1/02*; B01D *5/00*; C05F *3/00*
U.S. Cl. 210—10 **7 Claims**

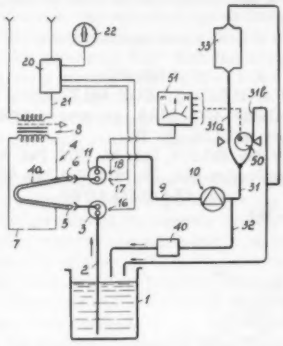
1. A process for dewatering organic sewage sludge to provide an acidic dewatered sludge, comprising the steps of
(a) adding ferric chloride to the organic sludge to lower the pH thereof to about 3.5 or less,
(b) then adding an amount of calcium carbonate to said organic sludge to increase the pH level thereof to a value greater than 3.5 but less than 5.7, and
(c) then dewatering said organic sludge by a mechanical dewatering process,
whereby the resulting dewatered sludge has a pH less than 5.7.

4,180,460

PORTABLE MACHINE FOR REGENERATIVE DIALYSIS

Alessandro Calari, Mirandola, Italy, assignor to Bellco S.p.A., Mirandola, Italy

Filed Dec. 11, 1978, Ser. No. 968,586
Claims priority, application Italy, Jan. 20, 1978, 19480 A/78
Int. Cl.[2] B01D *13/00, 31/00*
U.S. Cl. 210—182 **8 Claims**



1. A portable machine for regenerative dialysis, characterized in that it comprises a reservoir for the dialyzing liquid, a suction duct immersed in said reservoir, a heating element connected to said suction duct, a first element sensing the temperature of the dialyzing liquid interposed between said suction duct and said heating element, a pump with the suction side thereof connected to said heating element, a second element sensing the temperature of the dialyzing liquid interposed between said pump and said heating element, a first and second delivery ducts of said pump opening into said reservoir, a dialyzer element interposed in said first delivery duct, a dialyzing liquid regenerating cartridge interposed in said second delivery duct, a first and second thermal probes respectively associated with said first and second temperature sensing elements, and a temperature adjusting member controlling said heating element and driven by said first and second thermal probes.

4,180,461

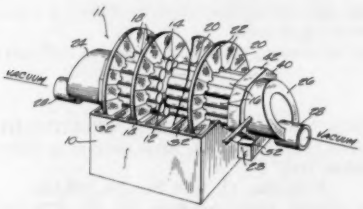
VACUUM SEPARATOR HAVING STAGGERED FILTRATE TUBES

Sigmund C. Langvik, Nesoeya, Norway, assignor to Scanmec A/S, Norway

Filed Apr. 4, 1978, Ser. No. 893,509
Int. Cl.[2] B01C *33/02*
U.S. Cl. 210—333 A **14 Claims**

1. A vacuum separator comprising:
an air pressure source,
a pair of filter discs, each filter disc including a plurality of filter sectors, and
means for alternately connecting said air pressure source first to one of said filter sectors of one of said filter discs and subsequently to one of said filter sectors of the other of said filter discs, said connecting means including a pair of sets of parallel fluid conduits, said filter sectors of one of said filter discs being connected in fluid communication to respective ones of said fluid conduits of one of said sets of

conduits and said filter sectors of said other filter disc being connected in fluid communication to respective ones of said fluid conduits of the other of said sets of fluid conduits, and means for alternately connecting said air



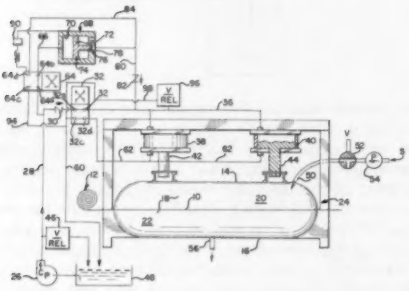
pressure source first to at least one of said conduits of said one of said pair of sets of conduits and subsequently to at least one of said conduits of the other of said pair of sets of conduits.

4,180,462

METHOD AND MEANS FOR FILTERING LIQUIDS

John A. Bos, Garden City, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Division of Ser. No. 881,379, Feb. 27, 1978, Pat. No. 4,137,175.
This application Dec. 26, 1978, Ser. No. 972,811
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—351 **2 Claims**



1. In a filtering system for removing particulate from a filtrate flow wherein said filtrate enters a filter cavity defined by a fixed shell portion, a movable shell portion and a replaceable filter media interfacing between said portions, the improvement therein comprising,

main pumping means having an intake connected to a reservoir providing storage for a fluid,

a first four-way valving means having a first, second, third and fourth port, said first valving means having a first state providing a flow path between said first and second ports and between said third and fourth ports respectively, and a second state providing a flow path between said first and fourth ports and between said second and third ports respectively, said first port connected to a discharge of said pumping means and said third port connected to said reservoir,

first check valve means connected between said pumping means and said first port of said four-way valving means to allow a flow of said fluid from said pumping means to said valving means and to prevent an opposite flow, and

operative means connected to said movable shell portion, said means having a first portion to selectively maintain said shell portion in a sealed relationship and a second portion to selectively place said shell portion in an unsealed relationship to allow an indexing of said filter media, said first portion connected to said second port and said second portion connected to said fourth port of said first four-way valving means,

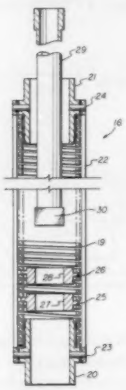
wherein said pumping means supplies said fluid to said first portion of said operative means with said first four-way valve being in said first state and said shell portions being maintained in said sealed relationship by said fluid being trapped between said operative means and said first check valve means, and said pumping means supplies said fluid to said second portion of said operative means with said first four-way valve being in said second state to place said shell portions in said unsealed relationship.

4,180,463

SELF-CLEANING HELICAL SPRING FILTER AND METHODS

Reynaldo Calderon, Houston, Tex., assignor to Reynaldo Calderon, White Plains, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,952
Int. Cl.[2] B01D *35/16*
U.S. Cl. 210—415 **5 Claims**



1. A self-cleaning helical spring filter comprising,

(a) helical spring means connected at each end to an elongated perforated sleeve means for spacing apart the spring convolutions by a predetermined distance for forming a filter,

(b) cleaning means positioned between two spring convolutions at one end of said spring,

(c) axially movable elongated rotatable rod means having a bar portion and a head portion for contacting said cleaning means,

(d) means for attaching said rod means to means to rotate, and vertical displacement means,

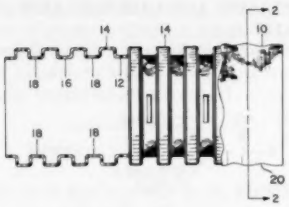
(e) said cleaning means being engageable with said means to rotate by said head portion in response to said vertical displacement means, so as to rotate said cleaning means between all of the spring convolutions to said spring means other end for scraping off all foreign material from between said spaced apart spring convolutions, and

(f) said cleaning means being disengageable from said rod means by said bar portion in response to said vertical displacement means, so as to allow said rod means to pass axially through said cleaning means and to rotate therein without rotating said cleaning means.

4,180,464
METHOD OF COVERING CORRUGATED DRAINAGE TUBES

Frank T. Beane, Rte. 4, Highway 49, Concord, N.C. 28025

Continuation of Ser. No. 626,630, Oct. 29, 1975, abandoned, which is a division of Ser. No. 483,391, Jun. 25, 1974, Pat. No. 3,976,578. This application Jan. 31, 1977, Ser. No. 764,162
Int. Cl.[2] B01D *29/14*
U.S. Cl. 210—497 R 2 Claims

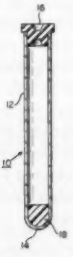


1. In the subsurface drainage of water from land wherein corrugated drainage pipe having alternating peaks and valleys and a plurality of openings in selected valleys arranged along the longitudinal axis of the pipe is buried beneath the surface of the ground, the method of preventing the pipe and its openings in selected valleys from becoming clogged with gravel, rock, mud, dirt and the like which comprises providing a length of pipe of the type described having a desired maximum diameter, providing a length of tubular knit fabric corresponding in length with the length of said pipe and having a maximum diameter in the relaxed condition less than said desired maximum diameter of the pipe, installing said tubular knit fabric on said pipe, and permitting the tubular knit fabric to relax into snug, tight engagement with the peaks of the pipe with intervening undulations of the tubular knit fabric extending inwardly toward the axis of the pipe in correspondence with the location of said openings as the tubular knit fabric spans the valleys of the pipe.

4,180,465
FLUID COLLECTION DEVICE WITH PHASE SEPARATION MEANS

Vabilisetti S. Murty, Creve Coeur, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Dec. 19, 1975, Ser. No. 642,514
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—516 19 Claims



1. A fluid collection device comprising:
(1) a container for receiving a specimen of a fluid separable into relatively lighter and heavier phases under centrifugation; and,
(2) a phase separation means in said container comprising:
(a) a gel-like material having a specific gravity intermediate the specific gravities of the separate phases
(b) said gel-like material being flowable from an initial position when said container with the fluid therein is subjected to centrifugation to a final position between the separate phases to form a substantially non-flowable partition between the separate phases,
(c) said gel-like material being such that it does not substantially contaminate the separated lighter phase,
(d) said gel-like material comprising a mixture of polybutene and a powdered filler with the mixture having a specific gravity ranging from 1.035 to 1.065.

12. A fluid collection device comprising:
(1) a container for receiving a specimen of a fluid separable into relatively lighter and heavier phases under centrifugation; and,
(2) a phase separation means in said container comprising:
(a) a gel-like material having a specific gravity intermediate the specific gravities of the separate phases,
(b) said gel-like material being flowable from an initial position when said container with the fluid therein is subjected to centrifugation to a final position between the separate phases to form a substantially non-flowable partition between the separate phases,
(c) said gel-like material being such that it does not substantially contaminate the separated lighter phase,
(d) said gel-like material comprising a mixture of liquid butyl rubber and a powdered filler with the mixture having a specific gravity ranging from 1.035 to 1.065.

13. A fluid collection device comprising:
(1) a container for receiving a specimen of a fluid separable into relatively lighter and heavier phases under centrifugation; and,
(2) a phase separation means in said container comprising:
(a) a gel-like material having a specific gravity intermediate the specific gravities of the separate phases,
(b) said gel-like material being flowable from an initial position when said container with the fluid therein is subjected to centrifugation to a final position between the separate phases to form a substantially non-flowable partition between the separate phases,
(c) said gel-like material being such that it does not substantially contaminate the separated lighter phase,
(d) said gel-like material comprising a mixture of liquid polybutadiene and a powdered filler with the mixture having a specific gravity ranging from 1.035 to 1.065.

14. A blood collection device comprising:
(1) a tube for receiving a sample of blood adapted to be centrifically separated into relatively lighter and heavier phases while in said tube,
(2) means closing one end of said tube,
(3) a stopper sealingly closing the opposite end of said tube,
(4) a negative pressure in said tube and maintained by said stopper,
(5) blood phase partitioning means disposed in said tube,
(6) said stopper being pierceable by a needle for drawing whole blood into said tube for centrifugation with said partitioning means,
(7) said partitioning means comprising a gel-like material having a specific gravity between that of the lighter phase of blood and that of the heavier phase of blood and being flowable during centrifugation of the blood from an initial position in said tube to a position between said phases upon separation of said phases,
(8) said material being substantially non-flowable after separation of said phases under normal handling conditions to form a barrier contact in the inner walls of said tube to sealingly separate said phases from each other,
(9) said gel-like material being such that it does not substantially contaminate the separated lighter phase, and
(10) the gel-like material comprising a mixture of polybutene and a powder filler with the mixture having a specific gravity ranging from about 1.035 to 1.065.

19. A blood collection device comprising:
(1) a tube for receiving a sample of blood adapted to be centrifugally separated into relatively lighter and heavier phases while in said tube,
(2) means closing one end of said tube,
(3) a stopper sealingly closing the opposite end of said tube,

(4) a negative pressure in said tube and maintained by said stopper,
(5) blood phase partitioning means disposed in said tube,
(6) said stopper being pierceable by a needle for drawing whole blood into said tube for centrifugation with said partitioning means,
(7) said partitioning means comprising a gel-like material having a specific gravity between that of the lighter phase of blood and that of the heavier phase of blood and being flowable during centrifugation of the blood from an initial position in said tube to a position between said phases upon separation of said phases,
(8) said material being substantially non-flowable after separation of said phases under normal handling conditions to form a barrier contact in the inner walls of said tube to sealingly separate said phases from each other,
(9) said gel-like material being such that it does not substantially contaminate the separated lighter phase, and
(10) the gel-like material comprising a mixture of liquid polybutadiene and a powder filler with the mixture having a specific gravity ranging from about 1.035 to 1.065.

4,180,466

METHOD OF LUBRICATION OF A CONTROLLED-SLIP DIFFERENTIAL

Thomas D. Newingham, Broomall; Alexander D. Recchuite, Boothwyn, both of Pa.; John Q. Griffith, III, Claymont, Del., and Marcus W. Haseltine, Jr., Brookhaven, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 116,985, Feb. 19, 1971, Pat. No. 3,825,495. This application Jul. 17, 1974, Ser. No. 489,216
The portion of the term of this patent subsequent to Jul. 23, 1991, has been disclaimed.
Int. Cl.[2] C10M *1/38;* **C07G** *17/00*
U.S. Cl. 252—48.6 **5 Claims**

1. In the process of lubricating a controlled-slip differential with a lubricating composition, the improvement wherein the lubricating composition comprises major amounts of a hydrocarbon base stock and friction improving amounts of synthetic sulfurized oil consisting essentially of a co-sulfurized blend of a triglyceride and an acyclic C_2–C_{128} monoolefin.

4,180,467

STABLE DENTURE SOAK PRODUCT

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 441,588, Feb. 11, 1974, abandoned, which is a continuation of Ser. No. 187,524, Oct. 7, 1971, abandoned, which is a continuation of Ser. No. 829,133, May 29, 1969, abandoned. This application Jan. 20, 1976, Ser. No. 650,600
Int. Cl.[2] A61K *7/20;* **C11D** *7/18*
U.S. Cl. 252—99 **3 Claims**

1. A stable water-soluble solid composition with sustained carbon dioxide effervescence and of substantially neutral pH when dissolved in an aqueous solution consisting essentially of 20 to 43% by weight of at least one solid water-soluble inorganic peroxygen salt, 35 to 50% by weight of sodium or potassium bicarbonate compound, 15 to 25% by weight of a solid water-soluble organic acid selected from the group consisting of tartaric, citric, malic, maleic, fumaric and succinic acids and 5 to 10% by weight of a solid water-soluble acid anhydride capable of hydrolyzing and reacting with the said carbonate to evolve carbon dioxide when said composition is dissolved in water and selected from the group consisting of boric, succinic, adipic, fumaric, tartaric, citric, malic and maleic anhydrides.

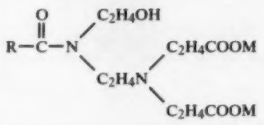
4,180,468

DISUBSTITUTED ALIPHATIC CARBOXYLAMIDOAMINES AS WELL AS DETERGENTS AND TOILETRY COMPOSITIONS CONTAINING SAME

Susumu Tomidokoro, Funabashi; Toshiyuki Ukigai, Yachiyo; Toshio Takahashi, Narashino, and Daini Saika, Chiba, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1977, Ser. No. 855,056
Claims priority, application Japan, Dec. 1, 1976, 51/144356
Int. Cl.[2] C09F *5/00;* **C11D** *9/30;* **A61K** *7/06*
U.S. Cl. 252—117 **15 Claims**

1. A disubstituted aliphatic carboxylamidoamine of the general formula:



wherein R stands for an aliphatic hydrocarbyl group with 7–17 carbon atoms and M for a hydrogen atom or an alkali metal atom.

4,180,469

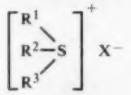
DITHIOCARBAMATE SULFONIUM SALT INHIBITOR COMPOSITION

James D. Anderson, Ambler, Pa., assignor to Amchem Products, Inc., New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,052
Int. Cl.[2] C11G *1/06*
U.S. Cl. 252—149 **5 Claims**

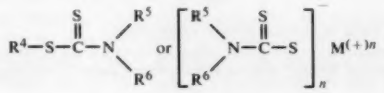
1. A process for cleaning industrial equipment, having water scale or other undesirable water insoluble deposits, with an aqueous hydrochloric acid cleaning solution wherein said acid solution is inhibited from attacking the basis metal of the industrial equipment by including in said cleaning solution an inhibitor combination consisting essentially of:

(a) a compound of the formula:

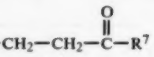


wherein R^1, R^2, and R^3 are each a hydrocarbon radical or substituted hydrocarbon radical selected from the group consisting of methyl, ethyl, propyl, nonyl, dodecyl, isobutyl, phenyl, hydroxyphenyl, dodecylphenyl, benzyl, 4-hydroxy-3,5-dimethylphenyl and p-chlorophenyl and wherein X is an anion selected from the group consisting of chloride, bromide, iodide and sulfate; and,

(b) a compound of the formula:



wherein R^4, R^5 and R^6 are each hydrogen or a hydrocarbon or substituted hydrocarbon radical selected from the group consisting of methyl, ethyl, isopropyl, octadecyl, dodecyl, decyl, benzyl, phenyl, naphthyl, cyclopentyl, cyclohexyl, thiozolyl, abietyl, pyridyl, quinolyl and



wherein R^7 is lower alkyl, and M is a cation selected from the group consisting of sodium, potassium, ammonium, lead, zinc, cadmium and antimony and wherein n is 1 to 3, said inhibitor combination being present in an amount sufficient to produce effective inhibition of basis metal attack by said acid solution with the proviso that from 0.1 to about 2.0 parts by weight of component (b) be present per part by weight of component (a).

4,180,470
METHOD FOR IMPROVED ACYL ISETHIONATE DETERGENT BARS

Richard Tokosh, Saddle Brook, and Arno Cahn, Pearl River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

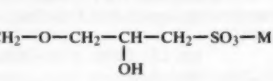
Continuation of Ser. No. 782,698, Mar. 20, 1977, abandoned. This application Jan. 25, 1978, Ser. No. 872,298

Int. Cl.[2] **C11D** *10/04, 1/28, 1/14*

U.S. Cl. 252—121 **11 Claims**

1. A method for reducing the wear rate of an acyl isethionate detergent bar having an unesterified water-soluble alkali metal isethionate as a bar processing aid, without adversely affecting the lathering properties of the bar, which comprises incorporating into said bar:

(a) from about 2% to 6% by weight of an alkoxy hydroxy propane sulfonate having the formula:



wherein n is an integer from 6 to 18; and M is sodium, potassium, calcium, magnesium or ammonium; and

(b) less than 1.2% by weight of sodium chloride;

the percentages being based on the total weight of the acyl isethionate detergent bar produced.

4,180,471
PRODUCTION OF BLENDS OF CRYSTALLINE ZEOLITE AND SODIUM TRIPHOSPHATE

Klaus Schrödter, Cologne; Joachim Kandler, Erfstadt, and Hasso Spott, Kerpen-Balkhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,240

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751354

Int. Cl.[2] **C01B** *33/28;* **C02B** *1/44;* **C11D** *11/00, 11/02*

U.S. Cl. 252—140 **4 Claims**

1. A process for making blends of one or more crystalline zeolites and sodium triphosphate which comprises: spray-drying a zeolite suspension jointly with an aqueous sodium orthophosphate solution or suspension, in which the molar ratio of Na to P necessary to produce zeolite-free sodium triphosphate containing Na and P in a theoretical ratio of 1.66 is reduced by decrements of 0.01% per each 10% by weight proportion of zeolite in the blend; the zeolite suspension being sprayed separately from the orthophosphate solution or suspension at a separation necessary for the resulting zeolite particles to dry superficially and for the resulting phosphate particles to undergo at least partial condensation; and contacting the superficially dry particles with the at least partially condensed particles.

4,180,472
DETERGENT COMPOSITIONS FOR EFFECTIVE OILY SOIL REMOVAL

Sharon J. Mitchell, and Rodney M. Wise, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 3, 1977, Ser. No. 838,788

Int. Cl.[2] **C11D** *7/24*

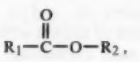
U.S. Cl. 252—162 **10 Claims**

1. An oily soil dissolving agent for removing oily soil from fabrics in an aqueous washing medium consisting essentially of:

(a) from about 20% to about 97% by weight of a water-insoluble solvent selected from the group consisting of:

(i) alkanes and alkenes having a flash point not lower than about 65° C. (Tag closed cup), an initial boiling point not lower than about 130° C., a solidification point not above about 20° C. and a carbon chain length from about 10 to about 18; and

(ii) fatty acid esters of the formula



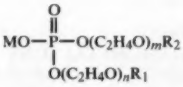
in which R_1 is an alkyl group with from about 7 to about 17 carbon atoms and R_2 is an alkyl group with from 1 to about 10 carbon atoms, the sum of carbon atoms in R_1 and R_2 being from about 8 to about 23;

(b) from about 3% to about 30% by weight of a water-in-oil emulsifier soluble in said solvent, said emulsifier having an HLB value of from about 2 to about 12 and consisting essentially of from about 25% to 100% of emulsifier compounds with at least two alkyl groups each having from about 9 to about 20 carbon atoms and selected from the group consisting of:

(i) dialkyl sulfosuccinic acid and alkali metal, alkaline earth metal, ammonium, and mono-, di-, and tri- C_{1-4} alkyl and alkanol ammonium salts of dialkyl sulfosuccinic acid, said alkyl groups each containing from about 9 to about 20 carbon atoms;

(ii) quaternary ammonium compounds with more than one long chain alkyl group selected from the group consisting of di- C_{9-20} alkyl ammonium chloride, bromide, methyl sulfate, nitrate and acetate and di- C_{9-20} alkyl imadazolinium quaternary ammonium compounds;

(iii) alkyl or alkyl ethoxy diesters of phosphoric acid having the formula



in which both R_1 and R_2 are alkyl groups containing from about 9 to about 20 carbon atoms, n and m are from zero to about 8 and M is hydrogen or a salt forming cation, and

(iv) mixtures thereof;

(c) from 0% to about 77% water; and

(d) from 0% to about 77% detergency builders selected from the group consisting of water soluble orthophosphates, polyphosphates, phosphonates, carbonates, bicarbonates, polyhydroxysulfonates, silicates, carboxylates and polycarboxylates, water-insoluble aluminosilicates and mixtures thereof.

8. A method of removing oily soil from fabrics comprising:

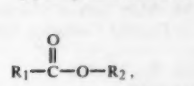
(1) contacting said fabrics with an aqueous washing medium consisting essentially of:

(a) from about 0.1% to about 3% by weight of a water-insoluble solvent selected from the group consisting of:

(i) alkanes and alkenes having a flash point not lower than about 65° C. (Tag closed cup), an initial boiling point not lower than about 130° C., a solidification

point not above about 20° C. and a carbon chain length from about 10 to about 18; and

(ii) fatty acid esters of the formula



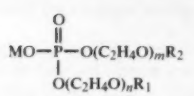
in which R_1 is an alkyl group with from about 7 to about 17 carbon atoms and R_2 is an alkyl group with from 1 to about 10 carbon atoms, the sum of carbon atoms in R_1 and R_2 being from about 8 to about 23;

(b) from about 3% to about 30% by weight of a water-in-oil emulsifier soluble in said solvent, said emulsifier having an HLB value of from about 2 to about 12 and consisting essentially of from about 25% to 100% of emulsifier compounds with at least two alkyl groups each having from about 9 to about 20 carbon atoms and selected from the group consisting of:

(i) dialkyl sulfosuccinic acid and alkali metal, alkaline earth metal, ammonium, and mono-, di-, and tri- C_{1-4} alkyl and alkanol ammonium salts of dialkyl sulfosuccinic acid, said alkyl groups each containing from about 9 to about 20 carbon atoms;

(ii) quaternary ammonium compounds with more than one long chain alkyl group selected from the group consisting of di- C_{9-20} alkyl ammonium chloride, bromide, methyl sulfate, nitrate and acetate and di-C_{9-20} alkyl imadazolinium quaternary ammonium compounds;

(iii) alkyl or alkyl ethoxy diesters of phosphoric acid having the formula



in which Both R_1 and R_2 are alkyl groups containing from about 9 to about 20 carbon atoms, n and m are from zero to about 8 and M is hydrogen or a salt forming cation, and

(iv) mixtures thereof; and

(c) from about 90% to about 99.6% water; and

(2) allowing said fabrics to remain in contact with said washing medium for at least 30 seconds.

4,180,473

METHOD OF TRANSPORTING METAL IONS

Gerald L. Maurer, Fairfield, and Sudhir K. Shringarpurey, Avon Lake, both of Ohio, assignors to National Research Laboratories, Cincinnati, Ohio

Continuation-in-part of Ser. No. 719,813, Sep. 1, 1976, Pat. No. 4,129,509, which is a continuation-in-part of Ser. No. 597,756, Jul. 21, 1975, Pat. No. 4,055,655. This application Oct. 21, 1977, Ser. No. 844,280

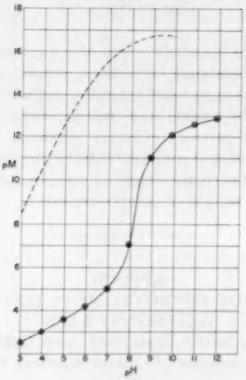
The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] **C09K** *3/00;* **C02B** *5/06*

U.S. Cl. 252—182 **15 Claims**

1. A method of transporting metal ions in a medium containing a moiety demanding said metal ions by introducing into said medium in an effective amount a metal complex of a metal ion and a polyfunctional organic ligand, said complex having an aqueous proton induced dissociation property represented by a sigmoidally-shaped curve on a cartesian coordinate plot of the negative log of the metal ion concentration versus the negative log of the hydrogen ion concentration, said dissociation property causing the controlled release of metal ions upon demand of said moiety.

7. The method of claim **1** wherein said complex is a dialkali-metal monoheavymetal chelate of an alpha-hydroxy polycarboxylic acid.



8. The method of claim **7** wherein said chelate is dialkali-metal monocopper(II) citrate.

4,180,474

RADIATION-HARDENABLE DILUENTS FOR RADIATION-HARDENABLE COMPOSITIONS

Karl-Ernst Schuster, Kerken; Hans J. Rosenkranz, Krefeld; Karl Furh, Krefeld, and Hans Rüdolph, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,089

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651507

Int. Cl.[2] **C09K** *3/00;* **G03C** *1/68*

U.S. Cl. 252—188.3 R **5 Claims**

1. A radiation-crosslinkable diluent for radiation-hardenable compositions comprising a mixture of triacrylates of a reaction product of trimethylol propane and ethylene oxide with an average degree of ethoxylation of from 2.5 to 4, the ethoxylated trimethylol propane being substantially free from trimethylol propane and having the following distribution:

4 to 5% by weight of monoethoxylation product;

14 to 16% by weight of diethylation product;

20 to 30% by weight of triethoxylation product;

20 to 30% by weight of tetraethoxylation product;

16 to 18% by weight of pentaethoxylation product; and

6 to 8% by weight of hexaethoxylation product.

3. A radiation-hardenable composition comprising a binder and a radiation-crosslinkable diluent as claimed in claim **1**.

4,180,475

LIQUID CRYSTAL MIXTURES

Martin Schadt, Seltisberg; Hanspeter Scherrer, Therwil, and Arthur Boller, Binningen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 18, 1977, Ser. No. 769,999

Claims priority, application Switzerland, Feb. 26, 1976, 2372/76; Jul. 9, 1976, 8832/76; Dec. 20, 1976, 15995/76

Int. Cl.[2] **C09K** *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **27 Claims**

1. A nematic liquid crystal mixture having positive anisotropy of the dielectric constants which comprises a nematogenic mixture with a clearing point above 60° C. and one or more solvents individually selected from the group consisting of a straight-chain alkane of 8–16 carbon atoms, an alkyl halide of 6–16 carbon atoms, a dialkyl ether of 4–8 carbon atoms in each alkyl radical, a dialkyl carbonate of 2–7 carbon atoms in each alkyl radical, an alkanecarboxylic acid alkyl ester the alkyl radicals of which together contain 6–16 carbon atoms

p-xylene, 1-phenylheptane, p-octylbenzoic acid methyl ester, and p-hexylbenzaldehyde.

4,180,476

PROCESS FOR THE EXTRACTION OF FISSION PRODUCTS

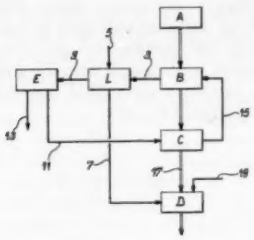
Maurice Anav, Villemoisson sur Orge; André Chesne, Le Vesinet; André Leseur, Fontenay-aux-Roses; Pierre Miquel, Chatillon sous Bagneux, and Roger Pascard, Saint Remy les Chevreuse, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 14, 1977, Ser. No. 860,452

Claims priority, application France, Dec. 30, 1976, 76 39569; Oct. 10, 1977, 77 30371

Int. Cl.² G21F *9/30*

U.S. Cl. 252—301.1 W **17 Claims**



1. A process for the extraction of fission products from irradiated nuclear fuel elements which have been subject to a temperature of at least 1200° C. during their irradiation, comprising the steps of:

(a) mechanically treating said irradiated fuel elements in order to decan and/or cut them;

(b) contacting the mechanically treated fuel elements with water to obtain an aqueous solution containing soluble fission products;

(c) separating the treated fuel elements from the thus obtained solution; and

(d) recovering at least one of said fission products from the separated solution.

4,180,477

LUMINESCENT MATERIALS

Roderick G. L. Barnes, Royston, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,248

Claims priority, application United Kingdom, Jan. 19, 1977, 02109/77

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 R **2 Claims**

2. A luminescent material comprising an aluminum garnet host material activated by trivalent terbium having a composition of the formula:

$$RE_{(3-x)}Tb_xAl_{(5-z)}Ga_zO_{12}(RE_2O_3)_w$$

in which RE is one or more of the elements yttrium, gadolinium, lutetium and bismuth, z has a value in the range of $0 \leqq z \leqq 5$, w has a value in the range of $0.02 \leqq w \leqq 0.05$ and x lies between 0.01 and 0.5, said luminescent material having enhanced brightness when compared to the corresponding material without the RE_2O_3.

4,180,478

ALKALINE EARTH HALIDE-RARE EARTH FLUORIDE PHOSPHOR

Tadao Omi, Yokohama; Minoru Watanabe, Kawasaki, and Toshio Nishimura, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 10, 1978, Ser. No. 885,346

Claims priority, application Japan, Mar. 14, 1977, 52-26960

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 H **4 Claims**

1. A phosphor having the formula;

$$nLaF_3.mAFCl:Eu_x$$

wherein:

A is at least one element selected from the group consisting of Ba, Sr and Ca, the Eu being present in the divalent state,

x is from 1×10^{-4} to 1, and

n/m is from 1×10^{-3} to 7×10^{-1}.

3. A phosphor having a general formula;

$$nLaF_3.mAFCl:Eu_x.Sm_y$$

wherein:

A is at least one element selected from the group consisting of Ba, Sr and Ca, the Eu being present in the divalent state,

x is from 1×10^{-4} to 1,

n/m is from 1×10^{-3} to 7×10^{-1}, and

y is from 1×10^{-4} to 1×10^{-1}.

4,180,479

STILBENE COMPOUNDS

Adolf E. Siegrist, Basel; Jean-Paul Pauchard, Fribourg, and Bernardo De Sousa, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

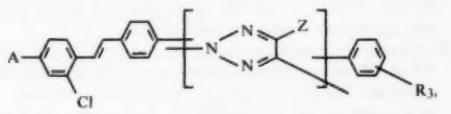
Filed Nov. 14, 1977, Ser. No. 850,864

Claims priority, application Luxembourg, Mar. 25, 1977, 77027

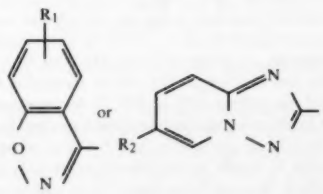
Int. Cl.² C07D *413/10*

U.S. Cl. 252—301.24 **12 Claims**

1. A stilbene compound of the formula



in which A is the radical



in which R_1 is hydrogen or chlorine and R_2 is hydrogen or alkyl having 1 to 4 C atoms, Z is hydrogen, chlorine or phenyl and R_3 is hydrogen, alkyl having 1 to 4 C atoms or chlorine.

4,180,480

CATALYTICALLY ACTIVE COMPOSITIONS FROM PRECIOUS METAL COMPLEXES

Melvin N. Jameson, St. Marys, and Gerald A. Krulik, Washington, both of W. Va., assignors to McGean Chemical Company, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 622,789, Oct. 15, 1975, abandoned. This application Dec. 21, 1978, Ser. No. 971,683

Int. Cl.[2] B01J *31/02;* C09D *5/00*

U.S. Cl. 252—429 R 24 Claims

1. A concentrated, catalytically active composition suitable for initiating electroless deposition of metal consisting essentially of the reaction product of a molten tin salt, said tin salt being selected from the group consisting of stannous chloride dihydrate and mixtures of stannous chloride dihydrate with at least one other compatible stannous salt, the melting point of said mixture being below about 140° C.; and the complex formed by reacting a soluble palladium salt, an effective amount of a halide salt from the group consisting of bromide and chloride salts compatible with said tin and palladium salts to render said composition catalytically active when added to an aqueous working bath, and a metal complexing agent capable of forming a complex with palladium.

4,180,481

MANUFACTURE OF A SUPPORTED CHROMIUM OXIDE CATALYST FOR OLEFIN POLYMERIZATION

Kurt Schulze, Wesseling, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,702

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734928

Int. Cl.[2] B01J *27/06, 29/00*

U.S. Cl. 252—441 2 Claims

1. A process for the manufacture of a supported chromium oxide catalyst from a catalyst precursor—which in turn comprises a finely divided carrier consisting of, or based on, silica, homogeneously charged with a chromium compound, which consists of chromium trioxide or a chromium compound which is converted to chromium trioxide under the conditions of stage (1), in the weight ratio of carrier: chromium compound, calculated as chromium trioxide, of from 100:0.1 to 100:10—by

(1) treating the catalyst precursor—with addition of a promoter in the weight ratio of catalyst precursor: promoter of from 100:0.1 to 100:10—at an elevated temperature with an oxygen-containing gas and then

(2) treating the product obtained from stage (1) with from 150 to 400 mole percent of carbon monoxide, based on the chromium dioxide content of the product, wherein, in both stages (1) and (2), the solid is in the form of a fluidized bed maintained by means of a stream of carrier gas, and wherein furthermore, in stage (1), the treatment with oxygen is carried out at from 530° to 1200° C. for a period of at least 30 minutes, using an anhydrous carrier gas which comprises from 10 to 100% by volume of oxygen, the remainder consisting of from 90 to 0% by volume of nitrogen, and in stage (2) the carbon monoxide treatment is carried out at from 270° to 450° C. for a period of from 0.5 to 3 hours using an anhydrous and oxygen-free carrier gas consisting of nitrogen to which a total of from 100 to 1,000 mole %, based on the chromium trioxide content of the product obtained from stage (1), of carbon monoxide is added uniformly over the total period of the carbon monoxide treatment.

2. The process of claim 1, wherein the promoter is ammonium silico fluoride.

4,180,482

SELF-CLEANING CATALYTIC COATING

Atsushi Nishino; Kazunori Sonetaka; Kunio Kimura, and Yoshihiro Watanabe, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 13, 1978, Ser. No. 915,260

Claims priority, application Japan, Aug. 24, 1977, 52/102116

Int. Cl.[2] B01J *29/06;* A21B *1/00*

U.S. Cl. 252—455 R 20 Claims

1. In an article to be heated during use having a self-cleaning coating formed on a surface thereof that decomposes oils and greases spattered thereon to gaseous substances by catalytic oxidation, in which said self-cleaning coating comprises a porous matrix layer of an inorganic binder containing a matting agent which affords a matte surface to said matrix layer; a catalyst in the form of particles dispersed uniformly in said matrix layer, said catalyst comprising an oxidation catalyst that catalyzes oxidative decomposition of fatty acids at elevated temperatures and that has a tendency to undergo a change in color as the result of its catalytic action; the improvement comprising said coating containing a double oxide which is in the form of particles dispersed uniformly in said matrix layer and has such a color with stability that said change in color of said oxidation catalyst is concealed, whereby said self-cleaning coating scarcely exhibits a perceptible discoloration on the occurrence of said change in color.

4,180,483

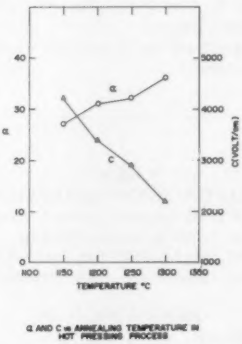
METHOD FOR FORMING ZINC OXIDE-CONTAINING CERAMICS BY HOT PRESSING AND ANNEALING

Shih M. Ho, Pittsburgh, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 755,774, Dec. 30, 1976, Pat. No. 4,111,852. This application Dec. 21, 1977, Ser. No. 862,734

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—518 9 Claims



Q AND C vs ANNEALING TEMPERATURE IN HOT PRESSING PROCESS

1. A method for forming a homogeneous electrically nonlinear ceramic body comprising the steps of

(a) simultaneously heating and pressing a mixture of zinc oxide powder and a single phase additive mixed oxide glass powder including at least bismuth oxide to form a consolidated ceramic body of electrical linearity, and

annealing said ceramic body under conditions to control grain size and promote diffusion of the zinc oxide and the additive glass in order to transform it to a body of electrical non-linearity.

4,180,484
CERAMIC COMPONENT FOR ELECTRODES

David D. Marchant, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 14, 1978, Ser. No. 915,419
Int. Cl.[2] H01B *1/08*
U.S. Cl. 252—521 **6 Claims**

1. An electrode for use in a MHD generator comprising: HfO_2 and a minor amount of Tb_4O_7, the Tb_4O_7 being present in an amount effective to stabilize at least 60 volume percent of the HfO_2 into the cubic structure.

4,180,485
SPRAY-DRIED DETERGENT COMPOSITIONS

Ramon A. Llenado, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 2, 1977, Ser. No. 847,983
Int. Cl.[2] C11D *3/08, 3/12, 3/34, 11/02*
U.S. Cl. 252—532 **9 Claims**

1. A granular detergent composition comprising:

(a) from about 5% to about 40% of a water-soluble organic surface active agent selected from the group consisting of linear alkyl benzene sulfonate, alkyl sulfate, alkyl ethoxy ether sulfate, and mixtures thereof, said alkyl groups containing from about 10 to about 20 carbon atoms and said alkyl ethoxy ether sulfate having an average degree of ethoxylation of from about 1 to about 4 moles of ethylene oxide per mole of alkyl sulfate;

(b) from about 10% to about 60% of a finely divided water-insoluble aluminosilicate ion exchange material selected from the group consisting of:

(1) crystalline aluminosilicate material of the formula

$$Na_z[(AlO_2)_z.(SiO_2)_y].xH_2O$$

wherein z and y are at least 6, the molar ratio of z to y is from 1.0 to 0.5 and x is from 10 to 264, said material having a particle size diameter of from about 0.1 micron to about 10 microns, a calcium ion exchange capacity of at least about 200 mg. $CaCO_3$ eq./g. and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/minute/gram;

(2) amorphous hydrated aluminosilicate material of the empirical formula $M_z(zAlO_2.ySiO_2)$ wherein M is sodium, potassium, ammonium, or substituted ammonium, z is from about 0.5 to about 2, y is 1, said material having a particle size diameter of less than about 100 microns, a magnesium ion exchange capacity of at least about 50 milligrams equivalent of $CaCO_3$ hardness per gram of anhydrous aluminosilicate and a Mg^{++} exchange rate of at least about 1 grain/gallon/minute/gram/gallon and

(3) mixtures thereof;

(c) from about 5% to about 30% of an alkali metal oxide silicate solid having a weight ratio of SiO_2:alkali metal oxide of about 1.6, and

(d) from about 0.5 to about 20% of a water-soluble salt of acetic acid,

said granular detergent having been prepared by mixing the above components with water to form a slurry, and then removing water from the slurry by drying.

6. A process for producing crisp, free-flowing detergent granules comprising the steps of:

(1) forming an aqueous slurry comprising:

(a) from about 3.5% to about 30% of a water-soluble organic surface active agent selected from the group consisting of linear alkyl benzene sulfonate, alkyl sulfate, alkyl ethoxy ether sulfate, and mixtures thereof, said alkyl groups containing from about 10 to about 20 carbon atoms and said alkyl ethoxy ether sulfate having an average degree of ethoxylation of from about 1 to about 4 moles of ethylene oxide per mole of alkyl sulfate;

(b) from about 7% to about 45% of a finely divided water-insoluble aluminosilicate ion exchange material selected from the group consisting of:

(1) crystalline aluminosilicate material of the formula:

$$Na_z[(AlO_2)_z.(SiO_2)_y].xH_2O$$

wherein z and y are at least 6, the molar ratio of z to y is from 1.0 to 0.5 and x is from 10 to 264, said material having a particle size diameter of from about 0.1 micron to about 10 microns, a calcium ion exchange capacity of at least about 200 mg. $CaCO_3$ eq./g. and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/minute/gram; and

(2) amorphous hydrated aluminosilicate material of the empirical formula $M_z(zAlO_2.ySiO_2)$ wherein M is sodium, potassium, ammonium, or substituted ammonium, z is from about 0.5 to about 2, y is 1 and said material having a particle size diameter of less than about 100 microns, a magnesium ion exchange capacity of at least about 50 milligrams equivalent of $CaCO_3$ hardness per gram of anhydrous aluminosilicate and a Mg^{++} exchange rate of at least about 1 grain/gallon/minute/gram/gallon and

(3) mixtures thereof;

(c) from about 3.5% to about 20% of an alkali metal oxide silicate solid having a weight ratio of SiO_2:alkali metal oxide of about 1.6;

(d) from about 0.4% to about 15% of a water-soluble salt of acetic acid; and

(e) from about 25% to about 50% water;

(2) drying the slurry to form crisp, free-flowing detergent granules.

4,180,486
MOLDING COMPOSITIONS AND PROCESS FOR PREPARING SAME

Edward F. Tokas, West Hatfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 16, 1978, Ser. No. 951,493
Int. Cl.[2] C08F *12/08;* **C08K** *5/01;* **C08L** *7/00, 25/06*
U.S. Cl. 260—4 AR **4 Claims**

1. A molding composition comprising a blend of a styrenic polymer containing at least about 10 weight percent based on total polymer weight of polymerized styrene and about 0.005 to about 2 percent by weight based on the weight of the polymer of a myrcene compound.

4,180,487
EPOXY CURABLE RESIN COMPOSITION

Don E. Floyd, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed May 4, 1978, Ser. No. 902,581
Int. Cl.[2] C08G *59/50, 73/02*
U.S. Cl. 260—18 N **18 Claims**

1. An epoxy curable resin composition comprising an adduct of:

(a) at least about three equivalents of a polyamine resin substantially free of polyamide groups containing at least two primary amine groups, and one secondary or tertiary amine group said polyamine resin having a fatty tail, and;

(b) one equivalent per three equivalents of component (a) of a polyfunctional acrylic compound which is an ester of a member selected from the group consisting of acrylic acid and methacrylic acid and mixtures thereof and at least an equivalent amount of a polyol.

4,180,488

STORAGE-STABLE LACQUER RESINS

Gerhard Stern, and Wilhelm Dobramysl, both of Linz, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

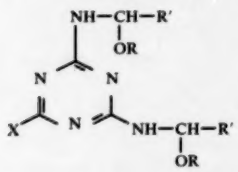
Filed Aug. 15, 1978, Ser. No. 933,926

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737984

Int. Cl.[2] C09D *3/52, 3/66, 3/81*

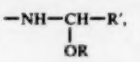
U.S. Cl. 260—21 7 Claims

1. In a process for the preparation of a storage-stable lacquer resin which can be baked without yellowing and which has a high reactivity, a good solubility in organic solvents and a low viscosity in solution and is based on the reaction product of an alkyd resin, acrylic resin or epoxy resin with a bis- or tris-alkoxyalkylamino-s-triazine, the improvement which comprises using a bis- or tris-alkoxyalkylamino-s-triazine which has been obtained from a triazine derivative of the general formula:



(I)

wherein X is an alkyl group having one to four carbon atoms, a phenyl group or the group



and each of R and R′ is an unbranched or branched alkyl group having up to six carbon atoms, by heating for a period of 3 to 300 minutes at a temperature of 100° to 200° C., up to a weight loss of 3% to 25%, relative to the dry weight of the triazine starting compound.

4,180,489

COATING COMPOSITION

Malcolm S. Andrew, Hazlemere, and Alan J. Backhouse, South Ascot, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 17, 1978, Ser. No. 897,173

Claims priority, application United Kingdom, Apr. 25, 1977, 17122/77

Int. Cl.[2] C08L *91/00*

U.S. Cl. 428—402 10 Claims

1. A coating composition suitable for spray application to a substrate which comprises (A) a film-forming polymer, (B) a volatile organic liquid diluent in which the polymer (A) is carried; (C) polymer microparticles having a diameter of from 0.01 to 10 microns which are insoluble in the combination of the film-forming polymer (A) and the diluent (B) and are maintained in a substantially deflocculated, sterically stabilized state of dispersion therein as a consequence of their having been prepared by a method involving two essential stages, namely (i) the polymerization of monomer, from which the microparticles are to be derived, in an inert liquid in which the resulting polymer is insoluble and under conditions such that the polymer is obtained in a state of stable dispersion, and (ii) the subsequent polymerization, in the same inert liquid and in the presence of the microparticles formed in the first stage, of monomer giving rise to a second polymer which is compatible with the film-forming polymer (A) and soluble in the combination of polymer (A) and diluent (B), and (D) metallic pigmentation also dispersed in the combination of polymer (A) and diluent (B).

4,180,490

ANTIBLOCK SYSTEM AND PROCESS AID FOR VULCANIZED VINYL ACETATE ETHYLENE COPOLYMERS

Robert D. Maclean, Wooster, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 835,762, Sep. 22, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,715

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 R 8 Claims

1. A vinylacetate-ethylene elastomeric copolymer vulcanizate containing an anti-blocking and processing release effective amount of an anti-blocking, processing release system comprising stearic acid, paraffin wax and a polyethylene having an average molecular weight of from about 1500 to about 4000, said processing release system being substantially uniformly distributed in said vulcanizate.

4,180,491

NONIONIC POLYURETHANE THICKENER WITH SURFACTANT COTHICKENER AND ORGANIC DILUENT, CLEAR CONCENTRATES, AQUEOUS PRINT PASTES, COLORING COMPOSITIONS, METHODS OF MAKING AND PRINTING

Samuel S. Kim, Huntingdon Valley, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 1, 1976, Ser. No. 746,449

Int. Cl.[2] C08L *75/08;* C09B *67/00;* C09D *11/10*

U.S. Cl. 260—29.2 TN 16 Claims

1. A clear concentrate composition for use in print pastes, comprising a mixture of about 5–50% by weight of (1) a primary thickener comprising a nonionic water soluble or water solulizable polyurethane, (2) a surfactant cothickener different from (1), in an amount providing a weight ratio of (1) to (2) of about 1:0.01 to about 1:10, (3) about 5–35% by weight of a non-aqueous, inert organic diluent, and (4) 0 to about 65% by weight of water, said polyurethane having a molecular weight of at least 10,000 and at least three hydrophobic branching groups, the hydrophobic groups containing a total of at least 20 carbon atoms and being linked through hydrophilic polyether segments of at least 1500 molecular weight each; wherein the polyurethane thickener is selected from the following reaction products wherein reactant (a) is at least one water soluble polyether polyol containing at least three hydroxyl groups, reactant (b) is at least one water insoluble organic diisocyanate, reactant (c) is at least one water insoluble organic polyisocyanate containing at least three isocyanate groups, reactant (d) is at least one hydrophobic organic monofunctional active hydrogen compound, reactant (e) is at least one hydrophobic organic monoisocyanate, and reactant (f) is at least one polyhydric alcohol or polyhydric alcohol ether containing three or more hydroxyl groups:

(I) reaction products of reactant (a) and (e),
(II) reaction products of reactants (a), (c) and (d),
(III) reaction products of reactants (a), (b), (d) and (f),
(IV) reaction products of reactants (a), (b), (e) and (f),
(V) reaction products of reactants (a), (b), (c) and (d),
(VI) reaction products of reactants (b), (e) and (f),
(VII) reaction products of reactants (a), (c) and (e),
(VIII) reaction products of reactants (b), (d) and (f).

4,180,492

THIODIGLYCOL DIBEHENATE AND METHOD OF USE

Jean Boussely, Paris; Marie-Madeleine Chandavoine; Michel Chignac, both of Sisteron; Claude Grain, Volonne, and Charles Pigerol, Saint-Ouen, all of France, assignors to Fevrier-Decoisy-Champion, Paris, France

Continuation of Ser. No. 829,866, Sep. 1, 1977, abandoned, which is a continuation of Ser. No. 683,416, May 5, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 918,849
Claims priority, application France, May 7, 1975, 75 14358
Int. Cl.[2] C08K 5/37
U.S. Cl. 260—30.8 R 2 Claims

1. A method of use of thiodiglycol dibehenate as lubricating agent for thermoplastic materials, which method consists in incorporating the said thiodiglycol dibehenate as internal lubricating agent in a formula of thermoplastic material containing a known external lubricating agent.

2. A method of use of thiodiglycol dibehenate as lubricating agent for thermoplastic material which method consists in incorporating the said thiodiglycol dibehenate as external lubricating agent in a formula of thermoplastic material containing a known internal lubricating agent.

4,180,493

COATING COMPOSITIONS FOR POLYCARBONATES

Harald Selbeck; Rolf Dhein, both of Krefeld, and Wolfgang Cohnen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,172
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717164
Int. Cl.[2] C08K 5/05, 5/07; C08L 61/28, 61/32
U.S. Cl. 260—32.8 N 4 Claims

1. A coating composition for polycarbonate surfaces comprising a solvent having little effect on polycarbonate and dissolved therein a mixture of:

(A) 86% to 98% by weight of copolymer having a hydroxyl number of from 30 to 80 and a weight average molecular weight of from 10,000 to 60,000 comprising copolymerized units of:

(a) 20% to 32% by weight of at least one aromatic vinyl monomer,

(b) 8% to 18% by weight of at least one hydroxylalkyl ester of acrylic or methacrylic acid containing from 2 to 12 carbon atoms in the alkyl group, and

(c) 50 to 70% by weight of at least one acrylic or methacrylic acid ester of a saturated aliphatic monoalcohol having 1 to 8 carbon atoms; and

(B) 2 to 14% by weight of at least one melamine resin.

4,180,494

THERMOPLASTIC POLYESTERS

Harry C. Fromuth, Trevose, Pa., and Kenneth M. Shell, Delran, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 824,674, Aug. 15, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 944,112
Int. Cl.[2] C08K 3/40; C08L 67/02
U.S. Cl. 260—40 R 10 Claims

1. A composition having high impact and solvent resistance comprising

A. about 25 to 95 percent by weight of an aromatic polyester;

B. about 1 to 8 percent by weight of an aromatic polycarbonate;

C. the balance to make 100% of a core-shell polymer polymerized from monomers comprising butadiene.

4,180,495

POLYESTER RESINS FLAME RETARDED BY POLY(METAL PHOSPHINATE)S

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 13, 1978, Ser. No. 895,839
Int. Cl.[2] C08K 5/53; C08G 63/68, 63/76
U.S. Cl. 260—45.75 K 8 Claims

1. The flame retarded resin compositions comprising a polyester and a flame retardant amount, namely 2.5 to 20 parts by weight per 100 parts by weight of polyester of at least one poly(metal phosphinate)s having one, two, three of four phosphinate groups per coordination center and selected from the respective formulae:

(a) MX, MaX, Ma_2X, Ma_3X, M(AA)X, $M(AA)_2X$,

(b) MX_2, MaX_2, Ma_2X_2, $MabX_2$, $M(AA)X_2$,

(c) MX_3, MaX_3, Ma_2X_3, $MabX_3$, $M(AA)X_3$, or

(d) MX_4

wherein

M is a metal selected from the group consisting of beryllium, magnesium, calcium, strontium, barium, titanium, zirconium, antimony, bismuth, chromium, molybdenum, tungsten, manganese, iron, ruthenium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, zinc, cadmium, mercury, aluminum, tin, lead and mixtures thereof;

X is a disubstituted phosphinate group having the structure

wherein

R and R_1 are independently selected from the group consisting of an aliphatic group of 1 to 20 carbons, a cycloaliphatic group of 3 to 20 carbons, an aromatic group of 6 to 12 carbons and said aliphatic, cycloaliphatic or aromatic groups can have substituted thereon, the substituted group being selected from the class consisting of a halogen, ether, hydroxyl, alkoxy, ketone and ester;

a and b are independent unidentate groups selected from the class consisting of oxy, alkoxy, hydroxyl and halide; and

AA is a bidentate ligand selected from the group consisting of acetylacetonate, picolinate, 8-hydroxyquinolinate, dimethylglyoximate and glycinate.

4,180,496

MELAMINE CYANURATE AS A FLAME RETARDANT AGENT

Akira Yanagimoto, Tokyo; Shunichi Kumazawa, Ichihara, and Yasuo Takakuwa, Fuchumachi, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 3, 1978, Ser. No. 866,379
Claims priority, application Japan, Jan. 17, 1977, 52-3828
Int. Cl.[2] C08K 5/34
U.S. Cl. 260—45.8 NT 7 Claims

1. A flameproof resin composition, which comprises: the admixture of 3 to 30 wt. % of an adduct of 2,4,6-triamino-1,3,5-triazine and 2,4,6-trihydroxy-1,3,5-triazine and/or a tautomer thereof with a linear polyester.

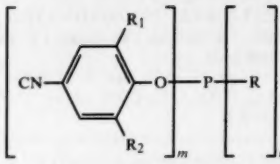
4,180,497

HINDERED PHENYL PHOSPHITES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 710,063, Jul. 30, 1976, Pat. No. 4,094,855. This application May 8, 1978, Ser. No. 904,060
Int. Cl.[2] C07F 9/08; C08K 5/52
U.S. Cl. 260—45.8 NT 10 Claims

1. A compound of the formula



wherein

R_1 and R_2 are independently lower alkyl or hydrogen, provided that only one of R_1 and R_2 is hydrogen,

m and n are each 1 or 2, the values of m and n being such that the trivalent state of p is satisfied,

R is

(a) halogen,

(b) hydroxyl, provided that m is 2 and n is 1 when R is hydroxyl,

(c) $-XR_5$ wherein X is S or O and R_5 is alkyl of 1 to 24 carbon atoms, phenyl, alkyl substituted phenyl.

2. A composition of matter comprising an organic polymeric synthetic material normally subject to thermal, oxidative and ultraviolet degradation stabilized with

(a) 0.005% to 5% of a stabilizing compound according to claim 1,

(b) 0 to 5% of a phenolic antioxidant,

(c) 0 to 5% of a thio co-stabilizer,

(d) 0 to 5% of a UV absorber, and

(e) 0 to 5% of a light stabilizer.

9. A composition according to claim 2 consisting essentially of

(i) polyolefin,

(ii) a stabilizing compound (a), and

(iii) 0.05 to 5% of a phenolic antioxidant selected from tetrakis[methylene 3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)-propionate]methane, octadecyl 3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)propionate, di-n-octadecyl-3,5-di-tert-butyl-4-hydroxybenzyl phosphonate, 2,6-di-t-butyl-4-methylphenol, and tris-2,4,6-(3,5-di-t-butyl-4-hydroxybenzyl)isocyanurate.

4,180,498

HINDERED PHENYL PHOSPHITES

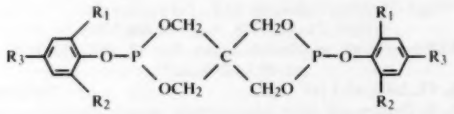
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 710,063, Jul. 30, 1976, Pat. No. 4,094,855. This application May 8, 1978, Ser. No. 904,062

Int. Cl.[2] **C07F** *9/08;* **C08K** *5/52*

U.S. Cl. 260—45.8 NT **10 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are independently lower alkyl or hydrogen, provided that only one of R_1 and R_2 is hydrogen,

R_3 is —(A)—$COOR_4$ or CN where

A is alkylene of 1 to 3 carbon atoms,

R_4 is alkyl of 1 to 24 carbon atoms, phenyl or alkyl substituted phenyl, and

R is 0 or 1.

2. A composition of matter comprising an organic polymeric synthetic material normally subject to thermal, oxidative and ultraviolet degradation stabilized with

(a) 0.005% to 5% of a stabilizing compound according to claim 1;

(b) 0 to 5% of a phenolic antioxidant,

(c) 0 to 5% of a thio co-stabilizer,

(d) 0 to 5% of a UV absorber, and

(e) 0 to 5% of a light stabilizer.

9. A composition according to claim 2 consisting essentially of

(i) polyolefin,

(ii) a stabilizing compound (a), and

(iii) 0.005 to 5% of a phenolic antioxidant selected from tetrakis methane, octadecyl 3-[3',5'-di-tert-butyl-4'-hydroxyphenyl)propionate, di-n-octadecyl-3,5-di-tert-butyl-4-hydroxybenzyl phosphonate, 2,6-di-t-butyl-4-methylphenol, and tris-2,4,6-(3,5-di-t-butyl-4-hydroxybenzyl)isocyanurate.

4,180,499

CARCINOEMBRYONIC ANTIGENS

Hans J. Hansen, Allendale, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 770,000, Feb. 18, 1977, Pat. No. 4,086,217, which is a division of Ser. No. 663,405, Mar. 3, 1976, abandoned, which is a division of Ser. No. 469,197, May 13, 1974, Pat. No. 3,956,258, which is a division of Ser. No. 252,700, May 12, 1972, Pat. No. 3,867,363, which is a continuation-in-part of Ser. No. 133,404, Apr. 12, 1971, Pat. No. 3,697,638, which is a continuation-in-part of Ser. No. 110,288, Jan. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 42,526, Jun. 1, 1970, abandoned. This application Jan. 9, 1978, Ser. No. 867,997

Int. Cl.[2] **C07G** *7/00*

U.S. Cl. 260—112 R **1 Claim**

1. A process for producing human carcinoembryonic antigen component B which comprises

(a) homogenizing human meconium in a glycoprotein solvent;

(b) separating the precipitate and solid particles from the homogenate;

(c) dialyzing the supernatant against a polyethylene glycol with an average molecular weight of about 15,000 to 20,000 and a softening point at 60° C.;

(d) dissolving the retentate in an aqueous buffer of about pH 7;

(e) separating the resulting precipitate;

(f) subjecting the resulting supernatant to sequential chromatography on two different gel columns, the first of which is a hydrophilic water-insoluble cross-linked dextran polymer gel and the second of which is an agarose gel having about 6% by weight agarose and a particle size of from 40 to 210 microns;

(g) collecting and concentrating the eluates which have a spectrophotometric absorption peak of wave length of 280 mμ and a molecular weight of about 200,000 to 500,000.

4,180,500

POLYPEPTIDES RELATED TO SOMATOSTATIN

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

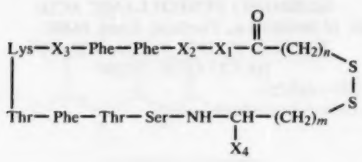
Filed Nov. 16, 1977, Ser. No. 851,928

The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.

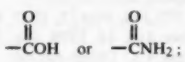
Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 S **7 Claims**

1. A chemical compound of the formula:



wherein:
X_1 is Arg or His;
X_2 is His, Tyr, or Glu;
X_3 is Trp or D-Trp; or 6-F-D-Trp
X_4 is



n is 1, 2, 3, or 4; and
m is 1 or 2;
or the reduced linear form thereof; or a non-toxic pharmaceutically acceptable acid addition salt thereof.

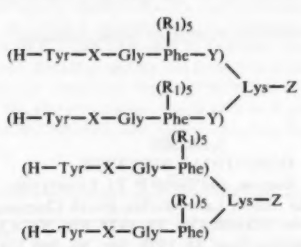
4,180,501

BIS (POLYPEPTIDE) DERIVATIVES OF ENKEPHALIN

David H. Coy, 4319 Perrier St., New Orleans, La. 65115, and Abba J. Kastin, 4400 Morales St., Metairie, La. 70002

Filed Jun. 16, 1978, Ser. No. 915,981
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **15 Claims**

1. A polypeptide of the formulae



(I)

(II)

wherein: X is a chiral residue of a D-amino acid selected from the group consisting of D-alanine, D-leucine, D-isoleucine, D-valine, D-norvaline, D-phenylalanine, D-tyrosine, D-tryptophan, D-serine, D-threonine, D-methionine, D-glutamic acid, D-glutamine, D-aspartic acid, D-asparagine, D-lysine, D-proline, D-histidine and D-arginine; Y is methionine or leucine and Z is selected from the group consisting of hydroxy, amino, loweralkylamino, diloweralkylamino and loweralkoxy; and the pharmaceutically acceptable salts thereof; R_1 is hydrogen or fluorine.

4,180,502

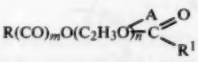
MANUFACTURE OF CONCENTRATED SOLUTIONS, HAVING A LOW SALT CONTENT, OF COBALT AND CHROMIUM 1:2 COMPLEX DYES WHICH ARE FREE FROM SULFONIC ACID GROUPS

Otto Kaufmann, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 811,464, Jun. 30, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,586
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634512
Int. Cl.[2] C09B *45/06, 45/10, 45/16, 45/20*
U.S. Cl. 260—145 A **9 Claims**

1. A process for the manufacture of a solution, which has a low salt content, of a sulfonic acid group-free o,o'-dihydroxy- or o,o'-hydroxycarboxy-azo dye cobalt or chromium 1:2 complex, which process comprises:

metallizing the azo dye with a metallizing agent to complex said dye with chromium or cobalt, the metallizing being carried out in water and a solvent consisting essentially of an organic compound of the formula:



I

in which A is hydrogen or methyl, m is zero or 1, n is an integer of from 1 to 3 and R and R' are, each independently, hydrogen or alkyl of 1 to 4 carbon atoms, and in the presence of at least one water-soluble salt selected from the group consisting of alkali metal and magnesium salts, and

separating the resulting two-phase system whereby the aqueous phase takes up the salts while the organic phase results in a concentrated solution, of low salt content, of the metal complex dye.

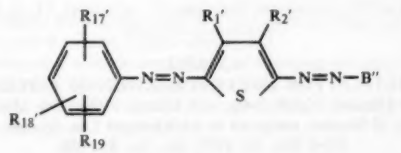
4,180,503

ACID DISAZO DYESTUFFS CONTAINING A SUBSTITUTED THIOPHENE MIDDLE COMPONENT

Dieter vor der Brück, Cologne, and Gerhard Wolfrum, Bergisch-Neukirchen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 11, 1975, Ser. No. 612,318
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1974, 2443485
Int. Cl.[2] C09B *31/14, 31/04, 31/06, 31/08*
U.S. Cl. 260—152 **5 Claims**

1. Acid disazo dyestuff of the formula



wherein

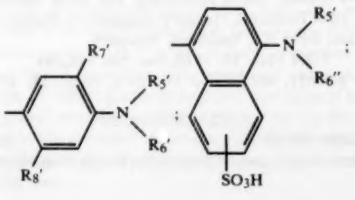
R_1' represents hydrogen, methyl, ethyl, carbo-C_1–C_4-alkoxy, phenyl, or phenyl substituted by Cl or NO_2;

R_2' represents carbo-C_1–C_4-alkoxy, cyano, $CONH_2$, $CON(CH_3)_2$ or $CON(C_2H_5)_2$;

R_{17}' and R_{18}' represent hydrogen; chlorine; bromine; cyano; C_1–C_2-alkyl; C_1–C_2-alkoxy; C_2–C_4-carboalkoxy; carbamoyl; carbamoyl mono- or di-substituted by C_1–C_3-alkyl; sulphamoyl; sulphamoyl mono- or disubstituted by C_1–C_3-alkyl; C_1–C_4-alkylsulphonyl; phenylsulphonyl; or benzylsulphonyl;

R_{19} represents hydrogen, C_1–C_4-alkyl, CF_3, Cl, or Br;

B'' is a radical of a coupling component selected from the group consisting of:



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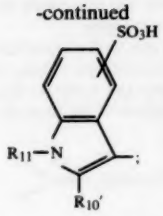
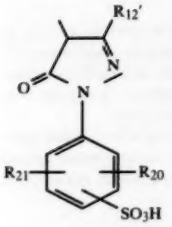
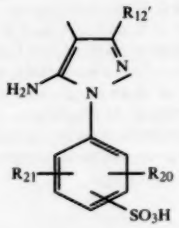




; and



wherein

R_5' represents hydrogen, C_1–C_4-alkyl, or benzyl;

R_6' represents C_1–C_4-alkyl, CH_2—CH_2—SO_3H, or 3-sulphobenzyl;

R_6'' represents hydrogen, C_1–C_4-alkyl, benzyl, or 2-phenylethyl;

R_7' represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, or C_1–C_4-alkylsulphonyl;

R_8' represents hydrogen, CH_3, C_2H_5, OCH_3, OC_2H_5, Cl, or NH—CO—$(CH_2)_n$—H with n = 1, 2 or 3,

R_{10}' represents methyl, ethyl or phenyl;

R_{11} represents hydrogen; C_1–C_4-alkyl; or C_1–C_4-alkyl substituted by halogen, cyano, hydroxyl, or C_1–C_4-alkoxy;

R_{12}' represents hydrogen, methyl, phenyl, carbomethoxy or carboethoxy; and

R_{20} and R_{21} represent hydrogen, C_1 –C_4-alkyl, Cl, or Br.

4,180,504

METHOD FOR THE PREPARATION OF ESTERS

Bertil Hansen, Helsingborg, and Krister Holmberg, Molndal, both of Sweden, assignors to Aktiebolaget Leo, Sweden

Filed Dec. 21, 1977, Ser. No. 863,058

Claims priority, application United Kingdom, Dec. 31, 1976, 54544/76

Int. Cl.² C07J *17/00*

U.S. Cl. 260—239.55 D **22 Claims**

1. In a process for the preparation of a carboxylic acid ester of high purity and in improved yield, comprising reacting in solution a carboxylic acid, a hydroxyl compound selected from the group consisting of alcohols and phenols, and a carbodiimide. in the presence of pyridine or a 3- or 4-lower-alkylpyridine. the improvement which comprises the step of including in the reaction mixture a strong acid.

4,180,505

NOVEL STEROIDSPIROOXAZOLIDINES AND PROCESS FOR THEIR PREPARATION

Sándor S. L. Toldy; Katalin Szilágyi née Faragó; Inge Schäfer; Eleonóra Szondy; János Borvendég, and Ilona Hermann née Szente, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszet, Gyar RT, Budapest, Hungary

Filed Mar. 14, 1978, Ser. No. 886,349

Claims priority, application Hungary, Mar. 14, 1977, GO 1364

Int. Cl.² C07J *21/00*

U.S. Cl. 260—239.55 R **10 Claims**

1. Oestr-4-en-3-one-17S-spiro-5'-(2'-oxo-3'-methyloxazolidine).

4,180,506

6β-BROMO PENICILLANIC ACID

Rex Pratt, 16 Brooks La., Portland, Conn. 06480

Filed Jan. 18, 1978, Ser. No. 870,398

Int. Cl.² C07D *277/04*

U.S. Cl. 260—245.2 **1 Claim**

1. 6-β-Bromo penicillanic acid.

4,180,507

4-OXA 2,6 DIAZABICYCLOHEPTANE DERIVATIVES

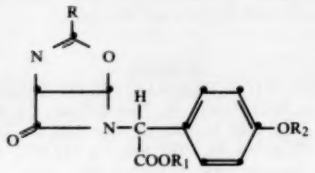
Robin D. G. Cooper; Gary A. Koppel, and Lawrence J. McShane, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 775,240, Mar. 7, 1977, Pat. No. 4,127,568. This application Aug. 15, 1978, Ser. No. 933,707

Int. Cl.² C07D *498/08*

U.S. Cl. 260—245.4 **3 Claims**

1. The compound of the formula



wherein R is C_1–C_3 alkyl, phenyl or benzyl;

R_1 is methyl, benzyl, 4-methoxybenzyl, or diphenylmethyl; and

R_2 is benzyl, 4-methoxybenzyl, or diphenylmethyl.

4,180,508

INDUSTRIAL BIOCIDES

Frank C. Becker, Gurnee, and Jorge P. Li, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 843,610, Oct. 19, 1977, Pat. No. 4,141,905. This application Nov. 13, 1978, Ser. No. 960,314

Int. Cl.² C07D *207/40*

U.S. Cl. 260—326.5 C **4 Claims**

1. The method to prepare N-(2-methyl-1-naphthyl)maleimide consisting essentially in heating equimolar amounts of 2-methyl-1-naphthylamine with maleic anhydride in the presence of lower fatty acid to a temperature between 100° C. and the boiling point of the reaction mixture for a period of 1–10 hours.

4. The method to prepare N-(2-methyl-1-naphthyl)-maleimide consisting essentially in heating equimolar amounts of 2-methyl-1-naphthylamine with maleic anhydride in the absence of a solvent to a temperature of 130°–190° C. for at least one hour.

4,180,509

α-ETHYNYL TRYPTOPHANES

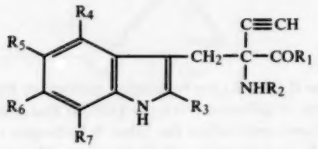
Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jul. 1, 1977, Ser. No. 812,052

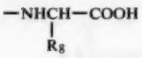
Int. Cl.² C07D *209/20*; A61K *31/405*

U.S. Cl. 260—326.14 T **8 Claims**

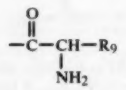
1. A compound of the formula



wherein R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, —NYY′ wherein each of Y and Y′ is hydrogen or a straight or branched lower alkyl of from 1 to 4 carbon atoms, or



wherein R_8 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_2 is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



wherein R_9 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_3 is hydrogen or methyl; R_4, R_5, R_6 and R_7 have the meanings defined in Table I wherein R_{10} is hydrogen, a straight or branched alkyl group of from 1 to 8 carbon atoms, alkylcarbonyl wherein the alkyl moiety has from 1 to 6 carbon atoms and is straight or branched, benzoyl or phenylalkylenecarbonyl wherein the alkylene moiety has from 1 to 6 carbon atoms and is straight or branched, and halo is chlorine, fluorine, bromine or iodine;

TABLE I

R_4	R_5	R_6	R_7
H	H	H	H
H	OR_{10}	OR_{10}	H
OR_{10}	H	H	H
H	OR_{10}	H	H
OR_{10}	H	OR_{10}	H
H	H	OR_{10}	H
OR_{10}	OR_{10}	H	H
CF_3	H	H	H
H	H	CF_3	H
H	halo	H	H
H	H	halo	H
H	halo	halo	H
halo	H	H	CH_3
OR_{10}	H	H	CH_3
H	OR_{10}	H	CH_3
H	H	OR_{10}	CH_3
H	H	H	halo
H	halo	H	halo
H	H	halo	halo
halo	H	H	halo
H	H	OR_{10}	halo
H	OR_{10}	H	halo
OR_{10}	H	H	halo
H	H	H	CF_3
H	OR_{10}	H	CF_3
H	H	halo	OR_{10}
H	OR_{10}	H	OR_{10}
H	halo	H	OR_{10}
OR_{10}	H	H	OR_{10}
halo	H	H	OR_{10}

or a pharmaceutically acceptable salt and individual optical isomers thereof.

4,180,510

METHOD FOR PREPARING THIENYLACETIC ACIDS

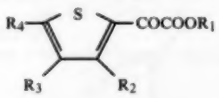
Yves Le Guen, Cour Couronne, and Georges Thiault, Nogent sur Marne, both of France, assignors to Produits Chimiques Auxiliaires et de Synthese, P.C.A.S., Paris, France

Filed Jan. 12, 1978, Ser. No. 868,909
Claims priority, application France, Jan. 12, 1977, 77 00678
Int. Cl.[2] C07D *333/24, 333/38*
U.S. Cl. 549—79 **4 Claims**

1. A method for the preparation of α-thienylacetic acid comprising:

condensing a thiophene compound of the formula:

wherein R_2, R_3 and R_4 are each hydrogen, halogen, or lower alkyl of 1 to 5 carbon atoms or are each lower alkyl or halogen, with a monochloride-monoester of oxalic acid in a solvent of methylene chloride or 1,2-dichloroethane in the presence of titanium tetrachloride, thereby forming a glyoxalic acid ester of the formula:



wherein R_1 is lower alkyl of 1 to 5 carbon atoms and R_2, R_3 and R_4 are as defined above; and

forming said α-thienylacetic acid by reducing said glyoxalic acid ester with hydrazine; and thereafter

reacting said reduced ester obtained with an aqueous potash solution.

4,180,511

ASCORBIC ACID PROCESS

Thomas C. Crawford, Norwich, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 945,034
Int. Cl.[2] C07D *307/62*
U.S. Cl. 260—343.7 **10 Claims**

1. In a process for the preparation of a compound selected from ascorbic acid and erythorbic acid which includes the steps of (a) reducing a compound selected from 2,5-diketogluconic acid, an n-alkyl ester of said acid wherein the alkyl group has from 1 to 4 carbon atoms and a salt of said acid selected from an alkali metal salt, an alkaline earth metal salt, an ammonium salt and a tetraalkylammonium salt having from 1 to 4 carbon atoms in each alkyl group, to form a reaction product containing borate impurities and, when said compound is selected from 2,5-diketogluconic acid and said salts of said acid, esterifying said reaction product; and (b) heating the product of step (a) in the presence of a base, the improvement which comprises the step of removing said borate impurities prior to said heating step.

4,180,512

PYRAN ANALOGS OF 4,5,13,14-TETRADEHYDRO-PGI$_1$ COMPOUNDS

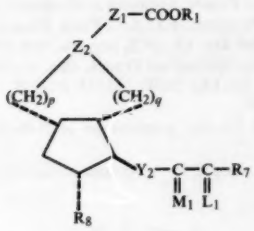
Herman W. Smith, Kalamazoo Township , Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 821,536, Aug. 3, 1977. This application Jun. 14, 1978, Ser. No. 915,440

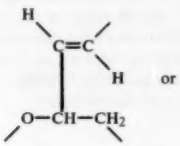
Int. Cl.^{2} C07D *311/02*

U.S. Cl. 260—345.2 **73 Claims**

1. A prostacyclin analog of the formula

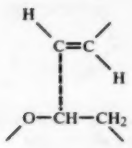


wherein Y_2 is —C≡C—;
wherein Z_2 is



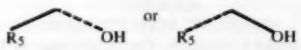
(1)

or



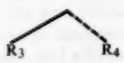
(2)

wherein one of p and q is one and the other is zero;
wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$, or
(2) $-(CH_2)_g-CH_2-CF_2-$,
wherein g is the integer zero, one, or 2;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein M_1 is



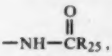
wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein L_1 is

or a mixture of

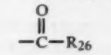


and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by

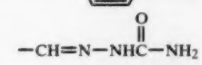


(a)



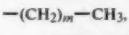
(b)

(c)

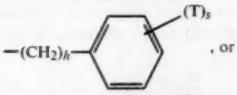


(d)

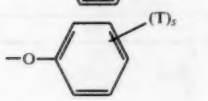
wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{27} is hydrogen or acetamido; phenacyl; phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;
wherein R_7 is



(1)



(2)



(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

4,180,513

METHOD FOR SYNTHESIZING ACID BLUE 104

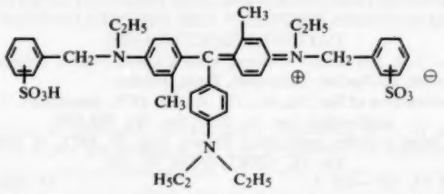
Yunn H. Chiang, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 17, 1978, Ser. No. 925,220

Int. Cl.^{2} C09B *11/18*

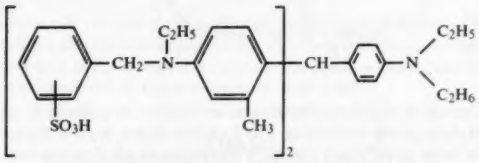
U.S. Cl. 260—392 **5 Claims**

1. A method for synthesizing Acid Blue Dye 104 which is represented by the formula



which comprises the steps of:

(a) reacting N-benzyl-N-ethyl-toluidinesulfonic acid with p-diethylaminobenzaldehyde in an aqueous oxalic acid solution having a pH of about 1.5 or less to form an intermediate which is represented by the formula



(b) isolating said intermediate and removing impurities therefrom by treatment with an organic solvent;

(c) providing a homogeneous aqueous buffer solution having at least about 3.5 weight percent of oxalic acid and at least about 35 weight percent of acetic acid based on the volume of said solution;

(d) dissolving said intermediate in said homogeneous buffer solution at a ratio of at least about 20 liters of buffer solution per mole of said intermediate;

(e) adding aqueous sodium dichromate solution to said solution of said intermediate at a temperature of from about −5° C. to about −10° C. and intimately mixing said solutions in about 60 seconds or less to form said Acid Blue Dye 104;

(f) isolating said Acid Blue Dye 104; and

(g) purifying said Acid Blue Dye 104 by dissolution in sulfuric acid and partially neutralizing the solution with a base.

4,180,514

ADHESION PROMOTER AND METHOD OF PREPARATION

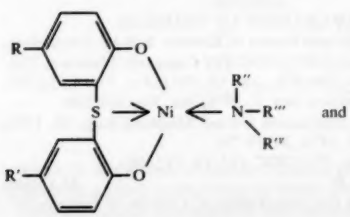
Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1978, Ser. No. 876,437
Int. Cl.[2] C08K *5/36*
U.S. Cl. 428—417 **32 Claims**

29. An article of manufacture which is subjected to an aqueous environment, said article having adhering to at least a part thereof a sealant composition comprising:

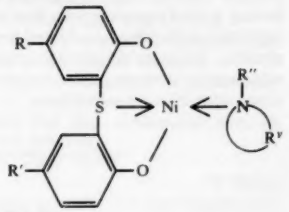
(a) a base material selected from the group consisting of rubbery polymers and resinous polymers;

(b) a nickel amine complex of 2,2′-thiobis (p-alkylphenol) selected from the group consisting of the materials having the formulas



and

-continued



wherein R and R′ are selected from the group consisting of hydrogen and alkyl and cycloalkyl groups containing 1 to about 18 carbon atoms, wherein R″, R‴, and R′ᵛ are selected from the group consisting of hydrogen and alkyl, cycloalkyl, aromatic, alkyl-substituted aromatic, and heterocyclic hydrocarbon groups which contain 1 to about 18 carbon atoms, wherein Rᵛ and N form a cyclic structure and wherein Rᵛ contains from 2 to about 12 carbon atoms.

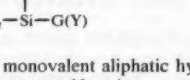
4,180,515

ORGANOSILICON COMPOUNDS WITH FUNCTIONAL GROUPS

Michel Bargain, Lyon, and Marcel Lefort, Caluire, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 20, 1977, Ser. No. 817,241
Claims priority, application France, Aug. 17, 1976, 76 25534
Int. Cl.[2] C07F *7/08*
U.S. Cl. 260—448.2 Q **4 Claims**

1. Organosilicon compounds corresponding to the general formula:



(I)

wherein R represents a monovalent aliphatic hydrocarbon or halocarbon radical having up to 10 carbon atoms and containing a carbon-carbon double bond; R_1 represents a member selected from the group consisting of a monovalent hydrocarbon radical having up to 10 carbon atoms and the halo and cyano derivatives thereof; G represents a divalent carbocyclic aromatic radical; Y represents a functional group selected from the group consisting of Cl, COOH, COOM, $COOR_2$ and COCl, in which M represents an atom of sodium, potassium or lithium and R_2 represents a linear or branched alkyl radical having up to 4 carbon atoms; and, n is an integer equal to 1 or 2.

4,180,516

CONVERSION OF SYNTHESIS GAS TO AROMATIC HYDROCARBONS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,622
Int. Cl.[2] C07C *1/04*
U.S. Cl. 260—449 R **8 Claims**

1. In the process of converting synthesis gas, comprising carbon monoxide and hydrogen, to an aromatic hydrocarbon product by contacting the synthesis gas at about 500° to 900° F. with a heterogenous catalyst comprising as a first component a carbon monoxide reduction catalyst and as a second component an aromatizing crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index of about 1 to 12; the improvement which comprises utilizing as

the carbon monoxide reducing catalyst component a mixed catalyst selected from the groups consisting of ZnO-Cr_2O_3 having a Zn:Cr atomic ratio less than about 4:1 alone or in admixture with a binder selected from the group consisting of alumina, zirconia, silica, titania and magnesia and thereby substantially increasing the conversion of said synthesis gas to aromatic hydrocarbon products.

4,180,517

CATALYST AND PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES

Jose L. Vidal, Charleston, and Wellington E. Walker, Sissonville, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 880,080, Feb. 2, 1978, abandoned. This application Nov. 7, 1978, Ser. No. 958,383

Int. Cl.[2] C07C *27/06, 31/06*

U.S. Cl. 260—449 L **17 Claims**

1. A process of producing an alkane polyol(s) which comprises reacting in a homogeneous liquid phase a mixture of hydrogen and oxides of carbon in the presence of a rhodium carbonyl phosphido cluster compound at a pressure between about 1,000 to about 50,000 pounds per square inch absolute and at a temperature of between about 210° C. and about 320° C., wherein the rhodium carbonyl phosphido cluster compound possesses an infrared spectrum which is characterized by two significant infrared bands between about plus and minus 15 cm^{-1} of about 2010 cm^{-1} and about 1815 cm^{-1}.

4,180,518

PEROXY COMPOUNDS

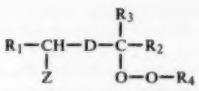
Orville L. Mageli, Kenmore, N.Y., and William A. Swarts, Dover, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 596,778, Jul. 17, 1975, Pat. No. 4,129,700. This application Aug. 28, 1978, Ser. No. 937,657

Int. Cl.[2] C07C *69/96*

U.S. Cl. 260—453 RZ **4 Claims**

1. A peroxy compound of the formula:



where:

(a) R_1 is hydrogen or an alkyl of 1–4 carbons;

(b) R_2 and R_3 are an alkyl of 1–4 carbons;

(c) R_4 is t-alkyl of 4–10 carbons, t-aralkyl of 9–16 carbons, t-cycloalkyl of 6–12 carbons or

(d) Z is

(e) R_5 and R_7 are independently an alkyl of 1–8 carbons; and

(f) D is ethynyl diradical, diethynyl diradical or alkyl diradical having 1–8 carbons.

4,180,519

PROCESS FOR OBTAINING AND PRODUCT ACRYLIC MONOMERS USEFUL IN THE PREPARATION OF CATIONIC FLOCCULANTS

Jean Neel, and Robert Violland, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

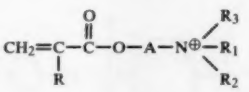
Continuation of Ser. No. 603,173, Aug. 8, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,559

Claims priority, application France, Aug. 23, 1974, 74 20460

Int. Cl.[2] C07C *141/10, 93/193*

U.S. Cl. 260—459 A **18 Claims**

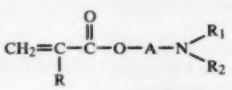
1. A process for preparing a highly concentrated aqueous quaternary acrylic ester monomer solution which is directly polymerizable to form hard, transparent, water-soluble, high molecular weight cationic acrylic polymers and which comprises a major content of a salt of a monomeric compound of formula I



(I)

wherein R represents hydrogen or methyl, A represents an alkylene group containing 1 to 3 carbon atoms, R_1 and R_2 are the same or different and each represents an alkyl group containing 1 to 4 carbon atoms, and R_3 represents a lower alkyl or benzyl group, said process comprising the steps of:

(a) reacting an aqueous mixture containing about 50 to about 90% of a compound of formula II



(II)

wherein R_1, R_2, R and A are as defined above, with a quaternizing agent of formula R_3X, wherein R_3 is as defined above and X is halogen or the $—CH_3SO_4$ group at a temperature of between about 10° and about 70° C. whereby a crude aqueous solution of a salt of a compound of formula I is obtained;

(b) treating said crude aqueous solution with a water-insoluble solvent in order to obtain a mixture comprising a purified aqueous phase containing the salt of the compound of formula I and being substantially free of impurities of unreacted starting materials and of impurities which induce the formation of water-insoluble polymers, and an organic phase containing the water-insoluble solvent and said impurities;

(c) separating the organic base of said mixture from the purified aqueous phase; and,

(d) further purifying said purified aqueous phase and recovering therefrom a highly concentrated clear aqueous solution of the salt of the compound of formula I sufficiently free of said impurities and organic solvents said aqueous solution being directly polymerizable into a hard, transparent, water-soluble, high molecular weight cationic acrylic polymer.

4,180,520

PREPARATION OF NITRILES

Pieter A. Verbrugge, and Petrus A. Kramer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

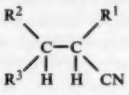
Division of Ser. No. 806,034, Jun. 13, 1977, Pat. No. 4,132,728. This application Sep. 5, 1978, Ser. No. 939,749

Claims priority, application United Kingdom, Aug. 16, 1976, 33969/76; Aug. 16, 1976, 33970/76

Int. Cl.[2] C07C *121/16, 121/66*

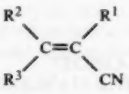
U.S. Cl. 260—465 R **14 Claims**

1. A process for the preparation of a nitrile of formula IV



IV

wherein R^1 represents an aryl group containing up to 12 carbon atoms or a hydrogen atom, and R^2 and R^3 each represents an alkyl group containing from 1 to 6 carbon atoms or a hydrogen atom, which process comprises reacting a nitrile of formula I



I

wherein R^1, R^2 and R^3 have the same meaning as in formula IV with an alkanol containing from 1 to 4 carbon atoms and magnesium in the presence of an ammonium salt in a molar ratio of ammonium salt to magnesium of at least 0.002.

4,180,521

PROCESS FOR THE PREPARATION OF NAPHTHALENE-1,3,6-TRISULPHONIC ACID

Horst Behre, Odenthal; Rolf Pütter, Duesseldorf, and Guido Steffan, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,696

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716029

Int. Cl.[2] C07C *143/30*

U.S. Cl. 260—505 C **11 Claims**

1. Process for the preparation of naphthalene-1,3,6-trisulphonic acid by sulphonating naphthalene with sulphuric acid and oleum, characterized in that naphthalene and most of the oleum are simultaneously metered over a period of about 10 to 200 minutes into sulphuric acid or oleum of low concentration, which has been initially introduced, at about 140° to 240° C., all of the naphthalene being added by the end of the simultaneous metering, the temperature is kept at about 140° to 240° C. for some time, the remainder of the oleum is then added at about 140° to 240° C., the time between the end of the first addition of oleum and the beginning of the second addition of oleum being about 0.25 to 10 hours, and the mixture is then further stirred for some time.

4,180,522

N-(2-DIMETHYLAMINOALKYL)-3',4'-DICHLOROANILIDES

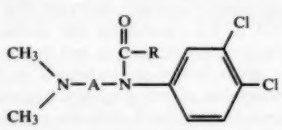
Michael P. Kane, and Jacob Szmuszkovicz, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 838,767, Oct. 3, 1977, abandoned, which is a continuation of Ser. No. 746,863, Dec. 2, 1976, abandoned. This application Aug. 16, 1978, Ser. No. 934,239

Int. Cl.[2] C07C *103/375*

U.S. Cl. 260—562 R **10 Claims**

1. A compound of the formula



wherein A is alkylene of two to 3 carbon atoms, inclusive;
wherein R is ethyl, cyclopropyl or vinyl, or the pharmacologically acceptable acid addition salts thereof.

4,180,523

MANUFACTURE OF N-[3,4-DIMETHYLPHENYL]-D-RIBAMINE

Herbert Scholz, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

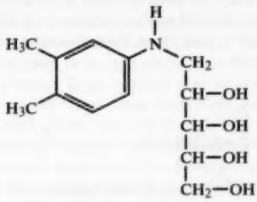
Continuation of Ser. No. 745,433, Nov. 26, 1976, abandoned. This application Jul. 11, 1978, Ser. No. 923,537

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558515; Dec. 24, 1975, 2558516

Int. Cl.[2] C07C *91/40*

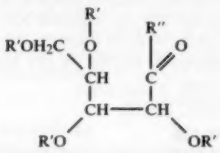
U.S. Cl. 260—573 **5 Claims**

1. A process for the manufacture of N-[3,4-dimethylphenyl]-D-ribamine of the formula I



I

which comprises: catalytically hydrogenating 3,4-dimethylaniline or 3,4-dimethylnitrobenzene and a D-ribonic acid derivative of the formula II



II

where each R′ is hydrogen or one of the R's together with R″ is a single bond, R″ is hydroxyl, OR‴ or, together with R′, a single bond, and R‴ is a hydrocarbon radical of 1 to 10 carbon atoms which may or may not be substituted by one or more hydroxyl groups in an inert solvent at from 125° C. to 155° C. using an effective amount of catalyst which contains copper oxide, copper or mixtures thereof.

4,180,524

DISPROPORTIONATION/DOUBLE-BOND ISOMERIZATION OF OLEFINS

Robert E. Reusser, and William B. Hughes, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1978, Ser. No. 878,537

Int. Cl.[2] C07C *11/02, 15/09*

U.S. Cl. 585—644 **23 Claims**

1. A process for the treatment of an olefinic hydrocarbon which comprises contacting said olefinic hydrocarbon under effective double bond isomerization and disproportionation conditions with an activated calcined homogeneous catalyst compositions consisting essentially of support/uranium/at least one of molybdenum, tungsten, and rhenium, containing about 0.1 to 25 weight percent total of uranium, molybdenum, tungsten, and rhenium, each calculated as the metal, and a proportion of uranium:molybdenum, tungsten, or rhenium of about 2:1 to 0.1:1, prepared by forming a homogenous composite of support, uranium, and at least one of molybdenum, tungsten, and rhenium, calcining said homogenous composite at elevated temperatures in a molecular-oxygen containing atmosphere, and thereafter activating at elevated temperature in a reducing atmosphere, thereby preparing said activated catalyst composition.

4,180,525
TRANS-HALO(ACYL)BIS(TRIETHYLPHOSPHINE) NICKEL(II) COMPLEXES

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 739,763, Nov. 8, 1976, Pat. No. 4,123,447. This application Aug. 3, 1978, Ser. No. 930,615
Int. Cl.² C07C *3/21*
U.S. Cl. 585—523 **10 Claims**

1. A process for oligomerizing monoolefins comprising contacting under suitable reaction conditions at least one said monoolefin with a catalyzing amount of a catalyst system comprising (1) at least one organoaluminum halide compound having the formula $R''_nALX_{3-n'}$ wherein each R'' is a hydrocarbyl radical having from 1 to 20 carbon atoms; each X is a halogen; and n is 1, 1.5, or 2; and (2) at least one acyl nickel complex having the formula

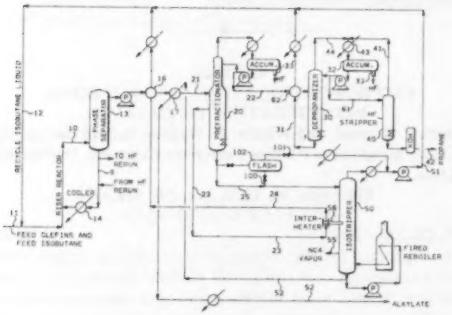
$$R-\overset{O}{\overset{\|}{C}}-Ni(PEt_3)_2X$$

wherein X is a halogen; PEt_3 is triethylphosphine; and R is selected from the group consisting of alkyl hydrocarbon radicals containing 6 to 12 carbon atoms; substituted aryl radicals containing 6 to 12 carbon atoms and having as the only nonhydrocarbon substituents 1 or 2 halogens selected from fluorine, chlorine, and bromine bonded to the aromatic portion of the aryl radical; and substituted aralkyl radicals containing 7 to 12 carbon atoms and having as the only nonhydrocarbon substituents one or more halogens selected from fluorine, chlorine and bromine bonded to the aromatic portion of the aralkyl radical.

4,180,526
ALKYLATION PROCESS UTILIZING SIDE DRAW VAPOR AS HEAT SOURCE IN ISOSTRIPPER

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1978, Ser. No. 922,916
Int. Cl.² C07C *3/54*
U.S. Cl. 585—719 **6 Claims**



1. An alkylation process comprising the steps of:
contacting an olefin and isoparaffin with an acid alkylation catalyst under alkylation conditions to form an alkylate-containing alkylation effluent,
passing said effluent to a phase separation zone and settling said effluent into a hydrocarbon phase and an acid catalyst phase,
passing said hydrocarbon phase to a prefractionation zone wherein the hydrocarbon phase is separated into at least three fractions with one fraction being an overhead vapor fraction, another being a bottoms liquid fraction, and the third being a side draw vapor stream, changing said bottom liquid fraction to an isostripper, and
passing said side draw vapor stream from the prefractionation zone in indirect heat exchange relationship with the interheater of said isostripper to thereby provide the majority of heat energy required for the isostripper.

4,180,527
PROCESS FOR THE MANUFACTURE OF CRYSTALLINE, CROSSLINKED, ELASTOMERIC EPOXIDE RESINS

Rolf Schmid, Gelterkinden, and Ursula Kreibich, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 680,265, Apr. 26, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,442
Claims priority, application Switzerland, Apr. 28, 1975, 5443/75
The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.
Int. Cl.² C08L *63/00*
U.S. Cl. 525—115 **21 Claims**

1. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins, characterised in that epoxide compounds, containing two or more epoxide groups, are reacted
(a) with polyester-polycarboxylic acids A which essentially contain segments of the formula I

$$-[O-(CH_2)_n-O.CO-(CH_2)_m-CO]_p- \quad (I)$$

in which n and m are identical or different and denote 2 or a higher number than 2, and to which the condition n+m=6 to 30 applies, and in which p denotes a number from 2 to 40 which, however, is sufficiently large that the segment contains at least 30 $-CH_2-$ groups, and
(b) with polyester-polycarboxylic acids B which essentially contain segments of the formula II

$$-[O-R^1-O.CO-R^2-CO]_q- \quad (II)$$

in which R^1 and R^2 are identical or different and denote an alkylene radical with at least 2 C atoms in the chain and in which, per O bridge, an average of at least 3.5 and at most 30 C atoms, without taking into account the C atoms of the —CO-.O— radicals, are present in the chain, and wherein the radicals R^1 and R^2 together contain at least one alkyl group as a substituent for one H atom, and in which q denotes a number from 2 to 40, which, however, is sufficiently large that the segment contains at least 30 C atoms, without taking into account the C atoms of the —CO.O— radicals, in the chain, and
(c) if appropriate, with curing agents C, and, if appropriate, in the presence of accelerators, in a ratio such that 0.5 to 1.2 equivalents of polyester-polycarboxylic acid are present per equivalent of epoxide compound, that 1/10 to 9/10 of these 0.5 to 1.2 equivalents are attributable to the polyester-polycarboxylic acid A and the remaining 9/10 to 1/10 to the polyester-polycarboxylic acid B, and that up to 0.6 equivalent of curing agent C is present per equivalent of epoxide compound, with the proviso that, in the cases in which only difunctional epoxide compounds and difunctional polyester-polycarboxylic acids A and B are employed, the epoxide groups must be present in excess and the reaction with a curing agent C is essential.

4,180,528
BLOCK COPOLYMER COMPOSED OF AN ADDITION POLYMER AND A LINEAR SATURATED POLYESTER

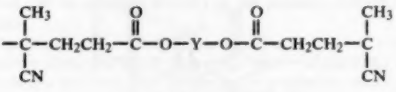
David R. Fagerburg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,208
Int. Cl.[2] C08G *81/02*; C08L *67/00*
U.S. Cl. 525—70 2 Claims

1. An A-B-A type block copolymer having a molecular weight of at least 5,000 wherein

the A- block is the monovalent radical remaining after removal of a terminal hydrogen atom from an addition polymer selected from the group consisting of polyethylene, polypropylene, polyacrylonitrile, polyvinyl chloride, polymethylmethacrylate, and polystyrene, and

the -B- block is a divalent radical which is soluble to at least one weight percent in chloroform and has the structure



where Y is the divalent radical remaining after removal of the terminal hydroxy groups from a linear saturated polyester having a molecular weight of at least 1500 selected from the group consisting of

a polyester prepared from

a dicarboxylic acid which can be terephthalic acid, isophthalic acid, 1,4-cyclohexanedicarboxylic acid or adipic acid, and

a diol which can be ethylene glycol, 1,4-butanediol, 1,4-cyclohexanedimethanol, neopentyl glycol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol, diethylene glycol or 1,6-hexanediol, and

a copolyester of caprolactone and a material selected from the group consisting of terephthalic acid, isophthalic acid, 1,4-cyclohexanedicarboxylic acid, adipic acid, ethylene glycol, 1,4-butanediol, 1,4-cyclohexanedimethanol, neopentyl glycol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol, diethylene glycol and 1,6-hexanediol and mixtures thereof.

4,180,529
ACRYLIC MULTISTAGE GRAFT COPOLYMER PRODUCTS AND PROCESSES

George H. Hofmann, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 858,887, Dec. 8, 1977, abandoned. This application Jan. 12, 1979, Ser. No. 3,089
Int. Cl.[2] C08L *33/08, 33/10, 33/12*
U.S. Cl. 525—85 14 Claims

1. A resilient, acrylic, multi-stage, sequentially produced polymer characterized by

(a) an elastomeric first stage comprising about 1–20% by weight of the polymer and having a glass transition temperature of between about −60° C. and 25° C., which is polymerized from a monomer mixture of 50 to 100 weight percent of at least one alkyl acrylate wherein the alkyl group contains 1 to 8 carbon atoms, 0 to 50 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer;

(b) a nonelastomeric, relatively hard second stage comprising about 15–65% by weight of the polymer and having a glass transition temperature greater than 25° C., which is polymerized in the presence of the first stage product from a monomer mixture of 70 to 100 weight percent of at least one alkyl methacrylate wherein the alkyl group has 1 to 4 carbon atoms, 0 to 30 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer;

(c) an elastomeric third stage, comprising about 30–75% by weight of the polymer and having a glass transition temperature of between about −60° and 25° C., which is polymerized in the presence of the first and second stage product from a monomer mixture of 50 to 100 weight percent of at least one alkyl acrylate wherein alkyl group contains 1 to 8 carbon atoms, 0 to 50 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer;

(d) a nonelastomeric, relatively hard fourth stage comprising about 5–40% by weight of the polymer and having glass transition temperature greater than 25° C. which is polymerized in the presence of the first, second and third stage product from a monomer mixture of 70 to 100 weight percent of at least one alkyl methacrylate wherein the alkyl group has 1 to 4 carbon atoms, 0 to 30 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer; said first and third stage combined comprising at least 40 percent by weight of the polymer.

4,180,530
CLEAR IMPACT RESISTANT THERMOPLASTIC STAR-BLOCK COPOLYMERS

Le-Khac Bi, Pittsburgh, and Ralph Milkovich, Murrysville, both of Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Feb. 5, 1979, Ser. No. 9,708
Int. Cl.[2] C08F *297/04*
U.S. Cl. 525—98 5 Claims

1. Star-block copolymers, of from 60 to 95% by weight of a monovinyl aromatic compound and 40 to 5% by weight of a conjugated diene of 4 to 8 carbon atoms, which have an average structure of the general formula $(A—B/A'\text{-}B')_mX—B\text{-}'—A'/B)_n$ where A is a non-elastomeric polymer segment based on the monovinyl aromatic compound, A′/B or B/A′ is an elastomeric polymer segment based on a random copolymer of the monovinyl aromatic compound and the conjugated diene, B′ is an elastomeric polymer segment based on the conjugated diene, m and n are integers whose sum is between 3 and 20, and X is the radical of a polyfunctional coupling agent by means of which the linear polymer segments (A—B-/A′—B′) and (B/A′—B′) are chemically bonded to form the star-block copolymers, wherein said segment A contains 80 to 90% by weight of the total monovinyl aromatic compound, segment B′ contains 20 to 40% by weight of the total conjugated diene, and segment B/A′ contains no significant blocks of either monovinyl aromatic compound or conjugated diene.

4,180,531
PROCESSIBLE AND VULCANIZABLE POLAR POLYMERS

Dominic Alia, 1609 Sheridan St., Williamsport, Pa. 17701

Filed Nov. 16, 1976, Ser. No. 742,398
Int. Cl.[2] C08L *23/08, 23/28, 23/34*
U.S. Cl. 525—214 14 Claims

1. A processible composition consisting essentially of

(i) a saturated polar polymer selected from the group consisting of chlorinated polyethylene, chlorosulfonated polyethylene or poly(vinyl chloride);

(ii) at least one ethylene copolymer, solid at 25° C., containing at least 50% by weight of ethylene and up to 50% by weight of one or more organic compounds which are interpolymerizable with ethylene containing a >C=C< ethylene linkage wherein the ethylene copolymer has a density between 0.92 and 0.96 as per ASTM D-792-60T

and a Melt Index of 0.2 to 200 g/10 min. as per ASTM D-1238-62T and

(iii) at least one peroxide vulcanizing agent, said composition comprising by weight to 100 parts of saturated polar polymer (i), about 10 to 400 parts by weight of ethylene copolymer (ii) and about 0.1 to 10 parts by weight of peroxide vulcanizing agent (iii), and said composition having a crosslinking half-life of about 0.2 to 1.5 minutes at 205° C.

4,180,532

PHOSPHORIC ACID ESTERS OF POLY(2-10)ETHYLENEOXY N BUTANE 1,4-DIOLS

Paritosh M. Chakrabarti, and Mohammed M. Hashem, both of Wayne, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,439
Int. Cl.² C07F *9/09*
U.S. Cl. 260—953 **8 Claims**

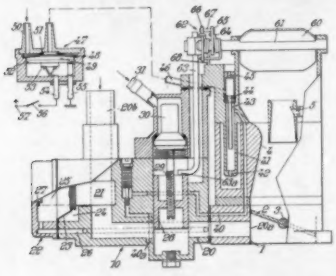
1. Compounds and mixtures of phosphoric acid esters poly(-2-10) ethyleneoxy n butane 1,4 diol.

4,180,533

CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Michael Bonse, Dusseldorf, Fed. Rep. of Germany, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly sur Seine, France

Filed Jan. 23, 1978, Ser. No. 871,540
Claims priority, application France, Feb. 8, 1977, 77 03487
Int. Cl.² F02M *1/06*
U.S. Cl. 261—39 A **8 Claims**



1. A carburetor for an internal combustion engine, having:

an induction passage,

operator actuatable main throttle means in said induction passage,

a main fuel delivery system opening into said induction passage upstream of said throttle means, and

an auxiliary starting device for delivering an additional flow of fuel and air to the induction passage during starting and cold running, said starting device comprising:

duct means opening into the induction passage downstream of the throttle means,

means for supplying fuel and air to said duct means,

a closure valve in said duct,

temperature responsive means for maintaining said closure valve in open condition until the temperature of said engine has reached a first predetermined value,

means, separate from the temperature responsive means, for decreasing the flow of fuel entering said duct means upon the engine becoming self operative,

a flap located in said induction passage upstream of the opening of the main fuel delivery system, said flap being arranged to be biased toward opening by the air flow around it,

return means for resiliently biasing the flap toward closure, with a force which decreases as the temperature of the engine increases, and

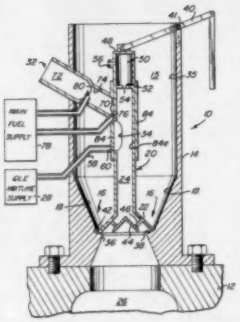
variable temperature-responsive stop means associated with the flap and preventing it from moving toward closure beyond a position of partial opening even under cold-start conditions.

4,180,534

APPARATUS FOR DISPENSING A FUEL-AIR MIXTURE IN AN AIRSTREAM

Alan B. Cutler, Missoula, Mont., assignor to Revas, Inc., Denver, Colo.

Filed Sep. 14, 1977, Ser. No. 833,013
Int. Cl.² F02M *11/00*
U.S. Cl. 261—41 B **8 Claims**



1. Apparatus for mixing fuel in an airflow and supplying the fuel and air mixture in an intake opening of an engine, comprising:

a main body member defining a substantially hollow cylindrical and axially extending interior portion and a frustroconically-shaped constricted portion converging inwardly from the cylindrical interior portion, the constricted portion terminating inwardly at a circular-shaped orifice, the orifice directly communicating with the intake opening of the engine;

an elongated throttle tube member defining a middle portion with a substantially hollow interior, a first end portion closing the hollow interior at one end of the middle portion, and a second fuel dispensing hollow end portion opening from the other end of the hollow interior of the middle portion, the second end portion having an outer frustroconically-shaped surface diverging outwardly from the middle portion, the hollow interior of the second end portion being defined by an inner frustroconically-shaped surface diverging outwardly from the hollow interior of the middle portion, the outward divergence of the frustroconically-shaped inner and outer surfaces terminating at a circular edge, the circular edge being of diameter at least equal to the diameter of the orifice, the middle portion further defining a primary intake opening formed therein and communicating with the hollow interior of the middle portion;

a positioning member attached to said main body member and having a center opening formed therein in axial alignment with the orifice of said main body member, the center opening adapted to receive the middle portion of said throttle tube member and to allow axial movement of said throttle tube member within the center opening;

the middle portion of said throttle tube member being received within the center opening of the positioning member with the second end portion of the throttle tube member generally within the constricted portion of the main body member and with the hollow interior of the second end portion opening into the orifice;

means for axially moving said throttle tube member from a closed position in which the circular edge of the second end portion substantially closes the orifice of the main body portion to an open position in which the circular edge is axially spaced from the orifice and transversely spaced from the constricted portion of said main body member;

a primary delivery port defined in said positioning member at a predetermined location to communicate with the primary intake opening of said throttle tube member upon movement of said throttle tube member to a predetermined open position, the predetermined location also substantially preventing communication of the primary delivery port with the primary intake opening upon movement of said throttle tube member to the closed position;

boost venturi means for operatively mixing fuel with air to form a primary fuel and air mixture, said boost venturi means operatively connected for supplying the primary fuel and air mixture directly to the primary delivery port; and

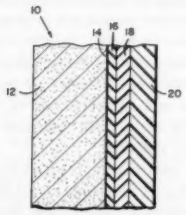
said primary intake opening being of predetermined configuration to expose increasing cross sectional amounts of the primary delivery port to the hollow interior middle portion in predetermined relation with increasing axial movement of said throttle tube member from the closed position toward the open position.

4,180,535

METHOD OF BONDING PROPELLANTS CONTAINING MOBILE CONSTITUTENTS

Richard G. Rhoades, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 5, 1978, Ser. No. 939,760
Int. Cl.[2] C06B *21/00*
U.S. Cl. 264—3 R **7 Claims**



1. A method of bonding propellants containing mobile constituents to a substrate to achieve the formation of an element of a strong bond system which additionally functions as a barrier to migration of said mobile constituents, said method comprising:

(i) providing a substrate material selected from the group of substrate materials consisting of a composite case of the fiber/resin type for a rocket motor, insulation material bonded to a composite case of the fiber/resin type for a rocket motor, and a liner material bonded to insulation material which is bonded to a composite case of the fiber/resin type for a rocket motor;

(ii) forming a metallic film of a metal by flame spraying or vapor depositing said metal on said substrate material onto which an uncured propellant is to be subsequently cast;

(iii) abrading said metallic film to provide a roughened surface to promote bonding of propellant to be cast onto said metallic film;

(iv) casting onto said metallic film an uncured propellant composition containing mobile constituents selected from the group consisting of carboranes, ferrocenes, and nitroglycerin; and

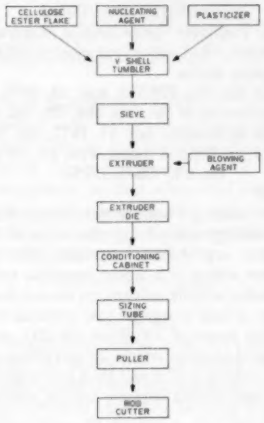
(v) curing said cast propellant composition to form a propellant grain that is bonded to said metallic film which serves as an element of a strong bond system and a barrier to migration of said mobile constituents to said substrate material.

4,180,536

PROCESS FOR EXTRUDING PLASTICIZED OPEN CELL FOAMED CELLULOSE ACETATE FILTERS

Carl J. Howell, Jr., Charlotte, N.C.; David W. Trott, Fort Mill, S.C., and Jesse L. Riley, Charlotte, N.C., assignors to Celanese Corporation, Charlotte, N.C.

Filed Mar. 13, 1978, Ser. No. 886,201
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—53 **11 Claims**



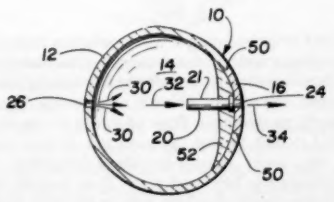
1. A process for the preparation of a plasticized, open cell, foamed cellulose acetate filter rod, said process comprising melt extruding through an elliptical or circular orifice of a screw extruder a mixture of cellulose acetate, a nontoxic, taste compatible thermally stable plasticizer having a boiling point of not less than 180° C., a blowing agent which is at least a partial solvent for cellulose acetate and a nucleating agent, said melt being substantially free of entrained air, and the extrusion pressure profile being such as to prevent said blowing agent from backing up in said screw extruder.

4,180,537

METHOD OF MAKING CERAMIC, SOUND-PRODUCING, ORNAMENTAL ARTICLE

Cessare M. Danova, 1760 Franklin Ave., Santa Monica, Calif. 90404

Filed Jun. 28, 1978, Ser. No. 910,148
Int. Cl.[2] C04B *37/00*
U.S. Cl. 264—62 **4 Claims**



1. A method of forming an ornamental sound-producing article consisting of a clay material comprising the steps of:

providing a mold having a predetermined-shape cavity;

forming a shell housing portion and an insert wall section of said clay in said cavity, said housing defining a chamber;
removing said housing and insert wall section from said mold;
forming a first hole in said housing;
forming a second hole in said insert wall section;
securing a sound-producing means to said insert wall over said second hole thereof; and
affixing said insert wall to said housing wherein said sound-producing means is disposed in said chamber.

4,180,538

METHOD OF MAKING CERAMIC SHAPED ARTICLE FROM INORGANIC RAW MATERIAL POWDER BY EXTRUSION MOLDING

Akira Morikawa; Yoshinori Narita, both of Nagoya, and Junichi Mizutani, Kuwana, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 570,803, Apr. 23, 1975, which is a continuation-in-part of Ser. No. 486,759, Jul. 9, 1974, abandoned. This application Jan. 17, 1977, Ser. No. 759,812
Claims priority, application Japan, Feb. 21, 1975, 50-22074
Int. Cl.[2] C04B *35/64*
U.S. Cl. 264—63 **7 Claims**

1. A method of making a honeycomb-shaped ceramic article by extrusion molding, comprising the steps of kneading an inorganic ceramic raw material powder with a plasticizer formed of a resin which is a water insoluble synthetic resin dissolved in a water soluble solvent, to form a kneaded body, the volume ratio of said inorganic raw material to said plasticizer being in the range of 100:50 to 100:200, and shaping a honeycomb-shaped ceramic article by extruding said kneaded body through a shaped orifice and then into water for hardening the honeycomb-shaped ceramic article without deformation or strain.

4,180,539

EXTRUSION PROCESS FOR AUTOMATICALLY THREADING LACES

Kenneth Clarke, Knebworth, England, assignor to Automatik Apparate-Maschinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Continuation of Ser. No. 653,149, Jan. 28, 1976, abandoned, which is a continuation of Ser. No. 473,269, May 24, 1974, abandoned, which is a continuation of Ser. No. 242,367, Apr. 10, 1972, abandoned. This application Nov. 28, 1977, Ser. No. 855,458
Claims priority, application United Kingdom, Apr. 14, 1971, 9350/71; Feb. 22, 1972, 8108/72
Int. Cl.[2] B29F *3/00*
U.S. Cl. 264—143 **2 Claims**

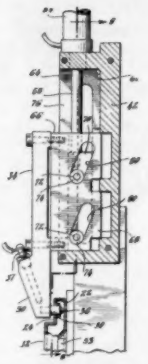
1. A method of granulating a thermoplastics material comprising extruding a melt of the thermoplastics material into a plurality of laces in side-by-side relationship through an air gap into the upper end of an inclined unsubmerged stationary cooling trough, providing a flow of water down the entire length of said trough so that the laces are carried down said trough by the water in side-by-side relationship and are quenched, passing the laces and water flow directly from the lower end of the trough to a lace cutting machine and cutting said laces to form granules in the lace cutting machine, the rate of flow of water being such that it exceeds the initial linear rate of extrusion of the laces and causes both any lace ends formed as a result of breakage of the lace or on commencement of extrusion and established laces to pass automatically down the trough and to be fed automatically with the water to the lace cutting machine.

4,180,540

METHOD OF MAKING A REINFORCED BEARING APERTURE IN THERMOPLASTIC SHEET MATERIAL

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Jan. 2, 1979, Ser. No. 25
Int. Cl.[2] B29C *17/00;* B29F *5/00*
U.S. Cl. 264—156 **5 Claims**



1. Method of forming a bearing aperture in thermoplastic sheet material of given thickness, which comprises:
supporting a sheet of said material in fixed position and penetrating said thickness with a heated punch pin of size approximating that of the desired finished aperture;
maintaining said heated punch pin in penetrating position in said material long enough to produce plastic flow of the displaced material resulting from said penetration, thereby causing said displaced material to assume a collar-like formation about said aperture, said collar formation having an axial thickness greater than said given thickness of the starting sheet material;
withdrawing said heated punch pin from the aperture thus formed and promptly inserting a cool punch pin therein of a size corresponding to that of the desired finished aperture, and maintaining said cool punch pin in penetrating position in said material long enough to inhibit further plastic flow in said collar-like formation; and
withdrawing said cool punch pin from said aperture.

4,180,541

METHOD OF EXTRUDING EMPLOYING AN EXTRUSION DEVICE HAVING INTERMEDIATE EXTRUDER

Ernesto Gabrielli, P.za Giovanni XXIII, Montale (PT), Italy

Continuation of Ser. No. 722,525, Sep. 13, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,392
Claims priority, application Italy, Sep. 17, 1975, 45513 A/75
Int. Cl.[2] B29D *7/14*
U.S. Cl. 264—171 **2 Claims**

1. A method of extruding pasty and thermoplastic material comprising the steps of:
directing the material into contact with a second rotating rotor (**64**);
carrying the material on the second rotor past a control extrusion device (**70**) and into a feed space to cause the material to form into a first layer on the second rotor;
moving said first layer on the second rotor past an opposite adjustable extrusion device (**72**) which extends into the

feed space more than the control device to form an infeed material mass (68);

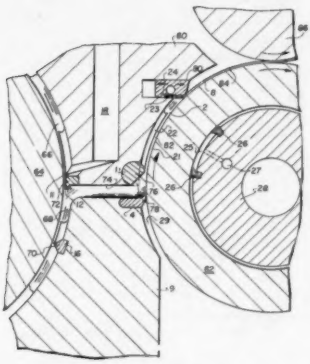
said infeed material mass being formed by the opposite adjustable extrusion device by a boundary layer breaking up of said first layer;

directing said infeed material mass through a first passage (74) and toward a first rotating rotor (62);

providing a first adjustable extrusion device (76) at the end of said first passage and at a position spaced from said first rotating rotor;

feeding said infeed material mass between said first adjustable extrusion device and said first rotating rotor to form a second layer on said first rotor;

moving said second layer on said first rotor into an extrusion passage (22);



providing a second adjustable extrusion device at an end of said extrusion passage spaced from said first rotor a distance less than the spacing between said first adjustable extrusion device and said first rotor;

moving said second layer past said second adjustable extrusion device to form a third layer which is thinner than said second layer and to cause an accumulation of material behind said extrusion device and effect a boundary layer break-up of said first layer; and

providing a leakage of material out of said extrusion passage in a position in said extrusion passage adjacent said second adjustable extrusion device to prevent a filling up of the extrusion passage in the area between said first and second extrusion devices due to said accumulation of material.

4,180,542

METHODS FOR MAKING MOLDED PLUG AND PLUG VALVE

Thomas J. Wrasman, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 641,181, Dec. 16, 1975, abandoned, which is a division of Ser. No. 548,157, Feb. 2, 1977, Pat. No. 3,961,770, which is a continuation-in-part of Ser. No. 394,037, Sep. 4, 1973, abandoned. This application May 11, 1978, Ser. No. 904,868

Int. Cl.[2] **B29F** *1/00;* **B29D** *3/00*

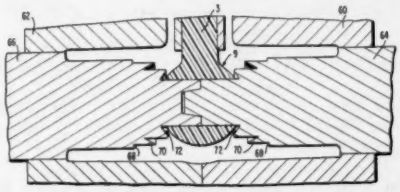
U.S. Cl. 264—242 **9 Claims**

1. A method of molding a rotary plug for use in a plug valve having a housing with seating faces, said plug being rotatably mountable within the housing and including a curved exterior surface which is engageable with the seating faces, said method comprising the steps of:

providing a pair of mold halves having cavity walls which form a first exterior surface portion of said plug to be substantially symmetrical about a turning axis of the plug;

placing a pair of core sections end-to-end for forming a through passageway through the plug, said cores having annular flange faces which form second exterior surface portions of said plug, defining annular seat-engaging surface areas which surround outer edges of both ends of the passageway to be formed and which are to engage inner ends of the seating faces in an open position of the plug; and

introducing molten molding material into the mold around said core and against said annular flange faces and hardening said material to form said plug with first mold parting lines on opposite sides of the plug lying in a plane containing the axis



of the through passageway except at said annular seat-engaging surface areas where second parting lines between the mold cavity halves and the flange faces of said cores define a closed curve symmetrical about the axis of the through passageway, so that when said rotary plug is disposed within the valve housing, said inner ends of said seating faces avoid contact with mold parting lines in both the open and closed positions of said plug.

4,180,543

AMMONIA SYNTHESIS REACTOR HAVING PARALLEL FEED TO PLURAL CATALYST BEDS

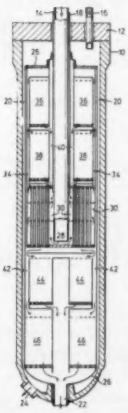
Stanley A. Ward, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 29, 1978, Ser. No. 891,385

Claims priority, application United Kingdom, Apr. 18, 1977, 15943/77

Int. Cl.[2] **B01J** *1/14, 3/04, 7/00, 8/04*

U.S. Cl. 422—148 **10 Claims**



1. An ammonia synthesis reactor comprising

(a) a cylindrical outer shell, having at least one gas inlet substantially concentric with said shell, and at least one gas outlet; said outer shell being capable of sustaining pressure in the range of about 100 to 500 atm. abs.;

(b) at least two axial catalyst bed sets, including an upstream bed set and a downstream bed set; each bed set consisting of a plurality of adiabatic catalyst beds; each bed having an inlet and an outlet mutually separated in a direction axial of said cylindrical outer shell, in combination with inlet header means disposed to feed the catalyst beds in

parallel and with outlet header means disposed to receive gas from the catalyst beds in parallel;

(c) a heat exchanger having a cold side in flow communication with said at least one gas inlet of the outer shell and having a hot side in flow communication with the outlet of the upstream bed set and the inlet of the downstream bed set; and

(d) a flow connection from the downstream bed set to a gas outlet of the outer shell.

4,180,544

CATALYTIC CONVERTER HAVING MONOLITH MOUNTING MEANS THEREIN

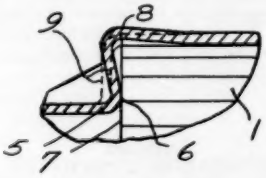
Enrique Santiago, Diedorf, Fed. Rep. of Germany, assignor to Zeuna-Stärker GmbH & Co. KG, Augsburg, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,446

Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2723532

Int. Cl.[2] **F01N** *3/15, 7/18*

U.S. Cl. 422—179 **2 Claims**



1. A device for the detoxification of the exhaust gases of combustion engines in motor vehicles comprising a monolithic metallic catalyst body, and a housing enclosing said catalyst body in a shock-resistant manner in its interior, said housing and catalyst body permitting flow-through of exhaust gases in an axial direction, said catalyst body having a circumferential surface, parallel to said flow-through direction, and resting against the interior of said housing, and said housing having at least one nose projecting inwardly against each facing end of said catalyst body said device being characterized by the following characteristics:

(a) the housing is a sheet-metal housing, in which said noses are formed as impressions in said sheet metal;

(b) said noses extend only in the vicinity of the circumferential edges of the catalyst body and project, each, axially toward the appropriate facing end, so that their heads rests against said facing ends;

(c) each impression that forms a nose is shaped in such a way, that the housing wall, opposed to the circumferential surface of the catalyst body is also slightly extended.

4,180,545

URANIUM RECOVERY FROM WET-PROCESS PHOSPHORIC ACID

John F. McCullough; John F. Phillips, Jr., and Leslie R. Tate, all of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 781,216, Mar. 25, 1977, now Defensive Publication No. T970,007. This application Aug. 25, 1977, Ser. No. 827,517

Int. Cl.[2] **C01G** *43/00*

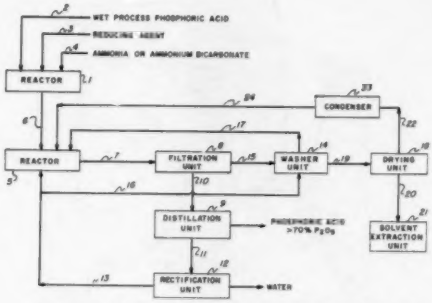
U.S. Cl. 423—8 **5 Claims**

1. A process for recovering uranium in a concentrated form from wet-process phosphoric acid by the use of ammonia or an ammonium salt, or both, a reducing agent, and a water-miscible solvent, which comprises the steps of:

A. mixing wet-process phosphoric acid with an ammonium salt or ammonia, or both, while maintaining the temperature of the reaction mixture between about 20° C. and about 100° C. for a period of time necessary to dissolve said ammonium salt or ammonia, or both, and reducing agent, wherein for each mole of orthophosphoric acid in said acid, about 0.05 to about 0.20 mole of ammonium salt or ammonia, or both, are used, and for each gram atom of iron present in said wet-process acid, one gram equivalent weight of reducing agent is used;

B. mixing a miscible solvent into the reaction mixture from step A supra while maintaining the temperature between 50° C. and reflux temperatures wherein for each pound of orthophosphate in said reaction mixture, about 1.93 to about 3.15 pounds of miscible solvent are used;

C. separating solids from liquid in said reaction slurry from step B, supra;



PRECIPITATION OF URANIUM CONCENTRATE FROM WET PROCESS PHOSPHORIC ACID WITH RECOVERY OF CONCENTRATED PHOSPHORIC ACID

D. washing said solids from step C supra with sufficient miscible solvent to remove phosphoric acid from the precipitate;

E. recycling said miscible solvent wash mixture from step D supra to later-mentioned step K;

F. drying washed solids from step D, supra;

G. condensing offgas from step F, supra, and returning said condensate back to step B, supra;

H. dissolving said solids from step F supra in mineral acid;

I. recovering uranium in the solution from step H, supra, by solvent extraction;

J. distilling water and miscible solvent from the filtrate from step C supra; and

K. rectifying miscible solvent and water from step J, supra, discarding water, and returning miscible solvent back to step B, supra.

4,180,546

PROCESS FOR REMOVING PHOSPHORUS FROM PHOSPHORUS-CONTAINING FLUORITE

Toshiyuki Shibata; Hiroshi Ono, both of Ube, and Kenji Isoyama, Onoda, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jul. 19, 1978, Ser. No. 926,016

Claims priority, application Japan, Jul. 21, 1977, 52/86621

Int. Cl.[2] **C01F** *11/22*

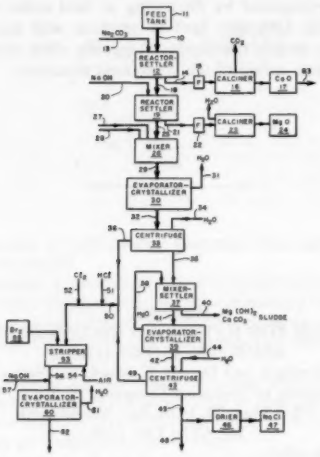
U.S. Cl. 423—178 **7 Claims**

1. A process for removing a phosphorus impurity from fluorite, the process comprising adding powder of fluorite containing the phosphorus impurity to an aqueous solution of an inorganic acid having an acid concentration of from 1.0 to 20 Wt% in an inorganic acid/phosphorus ratio of above 25:1 by mole to give a slurry, agitating the slurry at a temperature below 50° C., and collecting the powder from the slurry.

4,180,547
PROCESS FOR RECOVERY OF CHEMICALS FROM SALINE WATER

Anthony N. Chirico, Short Hills, N.J., assignor to Ecodyne, Lincolnshire, Ill.

Filed Nov. 25, 1977, Ser. No. 854,811
Int. Cl.[2] C01D 3/06
U.S. Cl. 423—197 33 Claims



30. A process for the recovery of chemicals from saline water, comprising:

converting the sulfates in the saline water to sodium sulfate, and separating essentially all of the magnesium and calcium from the saline water to form a magnesium and calcium depleted first solution;

mixing the first solution with recycled sodium chloride to form a sodium chloride fortified second solution;

crystallizing and then separating sodium chloride crystals from the second solution to form a third solution;

crystallizing sodium chloride and sodium sulfate crystals from the third solution to form a fourth solution;

separating the sodium chloride and the sodium sulfate crystals in the fourth solution from each other;

separating the sodium sulfate crystals from solution; and

mixing the sodium chloride crystals separated from the fourth solution with the first solution.

4,180,548
PROCESS FOR SELECTIVE REMOVAL OF CYCLIC UREA FROM HINDERED AMINE GAS TREATING SOLUTION

Geoffrey R. Say; James R. Hays, Sr., both of Baton Rouge, La., and Jagannathan N. Iyengar, Morris Plains, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

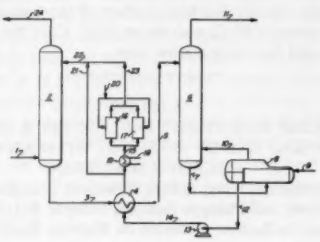
Filed Dec. 22, 1978, Ser. No. 972,500
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—223 7 Claims

1. An acid gas scrubbing process providing for the selective removal of a cyclic urea reaction product which forms as a by-product of the acid gas removal, said process comprising:

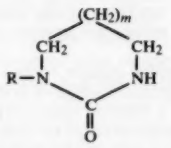
a. contacting an acid gas mixture with an aqueous solution in an absorption zone, said aqueous solution comprising a basic alkali salt, or metal hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and an activator for said basic salt comprising at least one sterically hindered amine having the generic formula:

$$R—NH—(CH_2)_m—NH_2$$

where R is a secondary or tertiary alkyl or cycloalkyl hydrocarbon having 4–20 carbon atoms and m is 2–5, at elevated



temperatures and pressures such that there is formed a cyclic urea reaction product having the formula:



where R is a secondary or tertiary alkyl or cycloalkyl hydrocarbon having 4–20 carbon atoms and m is 0–3;

b. passing said acid gas rich aqueous solution to a regeneration zone where it is contacted with steam to remove the acid gas impurities therefrom;

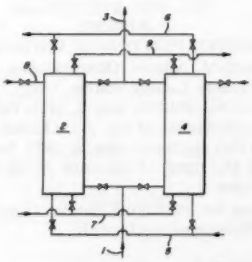
c. cooling a portion of the lean solution exiting from said regeneration zone to a temperature ranging from 180–120° F. to selectively precipitate the cyclic urea from said lean solution;

d. passing said lean solution containing said precipitated cyclic urea to a separation zone to remove at least a portion of the cyclic urea from said lean solution.

4,180,549
DESULFURIZATION OF HOT REDUCING GAS

Robert G. Olsson, Edgewood Borough, and Ethem T. Turkdogan, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1976, Ser. No. 718,257
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—230 23 Claims



1. In a process for desulfurizing hot reducing gas by contacting said gas with a desulfurizing agent, then regenerating the spent desulfurizing agent, and then reusing the regenerated desulfurizing agent for desulfurizing hot reducing gas, the improvement wherein the desulfurizing agent comprises a bed of sintered porous pellets comprising more than about 50% by weight manganese oxide and less than about 50% by weight of a nonreactive porous metal oxide wherein said pellets were sintered at a temperature between about 1000° C. and about

1400° C., and wherein the spent desulfurizing agent is regenerated by contacting said bed with an oxidizing gaseous atmosphere and wherein the temperature of the bed is maintained between about 500° C. and about 1300° C. in the desulfurization step and the regeneration step.

4,180,550
PROCESS FOR PURIFYING A SULFUR DIOXIDE CONTAINING GAS BY WASHING WITH AN AMMONIA AQUEOUS SOLUTION

André Deschamps, Noisy le Roi; Sigismond Franckowiak, Rueil-Malmaison, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 20, 1977, Ser. No. 835,085
Claims priority, application France, Sep. 20, 1976, 76 28409
Int. Cl.[2] C01B *17/00;* **C01C** *1/02;* **C01B** *17/50*
U.S. Cl. 423—242 **14 Claims**

1. In a process for purifying a sulfur dioxide containing gas, by washing with an ammonium aqueous solution, comprising the following steps:

(a) contacting a sulfur dioxide containing gas with either ammonia or ammonium sulfite or both in the presence of water, to form a solution containing either ammonium bisulfite or ammonium sulfite or both;

(b) reacting at least a portion of the solution obtained in step (a) with ammonium bisulfite, so as to decompose the ammonium bisulfite and sulfite and to obtain ammonium sulfate as an aqueous solution and gaseous sulfur dioxide;

(c) recovering the sulfur dioxide;

(d) heating the aqueous solution obtained in step (b) for vaporizing at least a portion of the water;

(e) heating the product from step (d) to convert the ammonium sulfate to ammonium bisulfate and gaseous ammonia;

(f) separating the gaseous ammonia obtained in step (e) and feeding it to step (a) either as such or as ammonium sulfite; and

(g) feeding to step (b) the ammonium bisulfate obtained in step (e) either as such or after dissolution in water;

the improvement which comprises heating at least a portion of either the ammonium sulfate or the ammonium bisulfate or both from step (e) with a catalytic quantity of either a molybdenum compound or a tungsten compound or a mixture thereof which favors the decomposition of said portion of either said ammonium sulfate or said bisulfate or both to sulfur dioxide and ammonia while strongly inhibiting the decomposition reaction resulting in sulfur trioxide, thereby avoiding an undesirable accumulation of either sulfate or bisulfate.

4,180,551
MODIFIED ZIRCONIUM PHOSPHATES

Abraham Clearfield, Athens, Ohio, assignor to Texas A&M University System, College Station, Tex.

Division of Ser. No. 494,579, Aug. 5, 1974, Pat. No. 4,059,679, which is a continuation of Ser. No. 132,569, Apr. 8, 1971, abandoned. This application Sep. 6, 1977, Ser. No. 830,937
Int. Cl.[2] C01F *13/00;* **C01B** *15/16, 25/26*
U.S. Cl. 423—249 **7 Claims**

1. A process for modifying the interlayer spacing of an inorganic compound of the formula

$$M(OH)_z(HQO_4)_{2-z/2}\cdot xS$$

to produce a product of the formula

$$M(OH)_zY_t^{m+}(QO_4)_{2-z/2}$$

wherein M is zirconium S is water or a non-aqueous solvent, Q is phosphorus z is a number from 0 to 2 including fractional values, x is an integer of from 0 to 8, Y is a cation of groups IA-IVA, IB-VIIB, VIII, including lanthanide and actinide series, or ammonium, mt is an integer corresponding to the charge of a cation Y, and t is a number such that mt equals 2-z/2, wherein at least 10 mole percent of said inorganic compound is converted to said product;

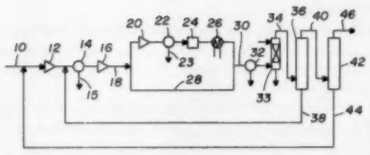
said method comprising mixing said inorganic compound in finely divided dry form with a finally divided solid salt of cation Y, which is other than M; and

heating said mixture at an elevated temperature for a time sufficient to incorporate said salt cation Y into said inorganic compound by displacing at least some of the replaceable hydrogen ions to produce said product and thereby modify the interlayer spacing while retaining the crystalline nature of the compound structure.

4,180,552
PROCESS FOR HYDROGEN RECOVERY FROM AMMONIA PURGE GASES

Tommy E. Graham, and Donald L. MacLean, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1978, Ser. No. 888,103
Int. Cl.[2] C01C *1/04*
U.S. Cl. 423—359 **17 Claims**

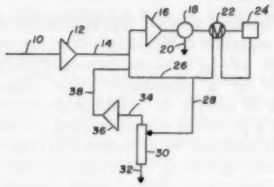


1. In a process for synthesizing ammonia from hydrogen and nitrogen comprising introducing a synthesis feed gas comprising nitrogen, hydrogen and at least one of methane and argon as an inert contaminant at substantially a superatmospheric synthesis pressure into an ammonia synthesis loop, reacting hydrogen and nitrogen in the ammonia synthesis loop at a superatmospheric synthesis pressure to produce ammonia in an ammonia synthesis reaction zone, removing ammonia from the ammonia synthesis loop, and removing a purge stream from the ammonia synthesis loop in an amount sufficient to maintain the concentration of inert contaminants less than about 25 percent wherein the purge stream is passed to a permeator comprising a separation membrane having a feed side and a permeate exit side and exhibiting selectivity to the permeability of hydrogen as compared to the permeability of each of methane and argon, a permeating gas is recovered at the permeate exit side of the separation membrane and is recycled to the ammonia synthesis reaction zone, the improvement wherein the permeator comprises at least two permeator stages in series, each permeator stage having a feed side and a permeate exit side in which the permeate exit side is at a lower total pressure than the total pressure on the feed side, wherein between permeator stages, the non-permeating gas from the feed side of one permeator stage is passed to the feed side of the next permeator stage; wherein at least one permeator stage has a lower ratio of total pressure on the feed side to total pressure on the permeate exit side than the ratio of total pressure on the feed side to total pressure on the permeate exit side of at least one subsequent permeator stage; and wherein the permeating gas from at least one permeator stage is recycled to the ammonia synthesis reaction zone.

4,180,553
PROCESS FOR HYDROGEN RECOVERY FROM AMMONIA PURGE GASES

Harold R. Null, Creve Coeur, and Eli Perry, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1978, Ser. No. 888,256
Int. Cl.[2] C01C *1/04*
U.S. Cl. 423—359 **12 Claims**



1. A process for synthesizing ammonia from hydrogen and nitrogen comprising:

a. introducing to and reacting in an ammonia synthesis reaction zone a nitrogen and hydrogen containing reactor feed gas at a superatmospheric synthesis pressure to produce ammonia said reactor feed gas comprising inert contaminants;

b. withdrawing an ammonia-containing reaction effluent from said ammonia synthesis reaction zone and recycling said reaction effluent to said ammonia synthesis reaction zone in an ammonia synthesis loop;

c. introducing a synthesis feed gas into said ammonia synthesis loop, said synthesis feed gas being at substantially said superatmospheric synthesis pressure and comprising nitrogen, hydrogen, and at least one of methane and argon;

d. removing ammonia from the reaction effluent in said ammonia synthesis loop;

e. removing a purge stream containing ammonia from said ammonia synthesis loop in an amount sufficient to maintain the concentration of inert contaminants in the reactor feed gas less than about 25 volume percent and being at substantially said superatmospheric synthesis pressure;

f. contacting said purge stream containing at least about 0.5% volume percent ammonia with a separation membrane, said purge stream when contacted with the separation membrane being at a superatmospheric pressure, said separation membrane having a feed side and a permeate exit side at a lower total pressure and exhibiting selective permeation of each of hydrogen and ammonia as compared to the permeation of each of methane and argon;

g. permeating through and recovering from the permeate exit side of said separation membrane a permeating gas comprising at least about 20 percent of the hydrogen and at least about 20 percent of the ammonia in the purge stream containing the separation membrane;

h. removing from the feed side of said separation membrane a non-permeating gas containing a lesser amount by weight of ammonia than the amount of ammonia in the purge stream contacting the separation membrane; and

i. recycling said permeating gas to said ammonia synthesis reaction zone.

4,180,554
METHOD FOR REMOVAL OF SULFUR DEPOSITED ON A CLAUS CATALYST

Clifton S. Goddin, Jr., and John W. Palm, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 14, 1978, Ser. No. 933,370
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 R **3 Claims**

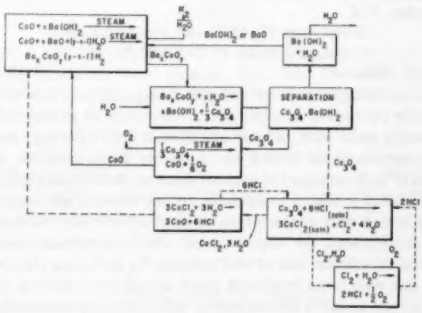
1. In a process for removal of sulfur from a gaseous stream containing hydrogen sulfide involving first recovering sulfur noncatalytically by burning said gaseous stream in a furnace followed by a waste heat boiler, and then further recovering sulfur catalytically by passing the effluent from the waste heat boiler through a series of Claus reactors with associated liquid sulfur condensers wherein one or more of the lead Claus reactors is operated in a so-called conventional temperature range which is higher than the sulfur dewpoint of the reacting gas and one or more of the following Claus reactors operates in a lower temperature range in which sulfur is strongly adsorbed on the catalyst, and wherein the temperature of the first Claus reactor is maintained sufficiently high to hydrolyze COS and CS_2 and wherein the resulting effluent from the final conventional Claus reactor passes through a low temperature Claus step involving at least two interchangeable reactors, and wherein said conventional Claus effluent at all times passes through at least one of said interchangeable, low temperature reactors to further convert the reactants and condense the sulfur for an interval during which the other said interchangeable, low temperature reactor catalyst is regenerated by vaporization of the deposited sulfur followed by cooling of the sulfur-denuded catalyst, the improvement comprising:

introducing initially into said interchangeable, low temperature Claus reactor about to be regenerated by removal of deposited sulfur a portion of the gaseous effluent from said first Claus reactor at a temperature of about 600° to 650° F. such as to heat the low temperature Claus catalyst and remove said deposited sulfur, and then having raised the temperature of said catalyst to about 600° to 650° F. introducing a hot gaseous stream into said interchangeable, low-temperature Claus reactor being regenerated such as to elevate the temperature of said regenerating catalyst bed to a value of about 700° F. prior to cooling and returning said interchangeable, low temperature Claus reactor to the adsorption mode.

4,180,555
PROCESS FOR PRODUCING HYDROGEN FROM WATER USING COBALT AND BARIUM COMPOUNDS

Carlos E. Bamberger, Oak Ridge, Tenn., and Donald M. Richardson, deceased, late of Oak Ridge, Tenn. (by Elizabeth B. Richardson, executrix), assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,768
Int. Cl.[2] C01B *1/09, 1/00*
U.S. Cl. 423—657 **8 Claims**



1. A process for producing hydrogen comprising the step of (a) reacting CoO with BaO or $Ba(OH)_2$ in the presence of steam at a temperature above about 500° C. to produce H_2 and a double oxide of Ba and Co.

4,180,556

PRETREATMENT METHOD FOR CARCINOEMBRYONIC ANTIGEN ASSAY

Yung D. Kim, Lindenhurst; Joseph T. Tomita, and Jay R. Schenck, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 776,019, Mar. 9, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,381

Int. Cl.[2] G01N *33/16;* A61K *39/00*

U.S. Cl. 424—1 8 Claims

1. In a method of measuring the level of carcinoembryonic antigen (CEA) in a specimen by pretreating with perchloric acid to dissociate the CEA material from binding proteins by precipitating said binding proteins, separating said precipitate from the CEA-containing supernatant, and measuring the level of CEA wherein the improvement comprises eliminating the necessity of dialysis to purify the perchloric acid treated specimen by:

(a) adding to said CEA-containing supernatant a buffered source of potassium ions to precipitate potassium perchlorate; and

(b) separating said potassium perchlorate precipitate to yield a CEA-containing supernatant ready for assay.

4,180,557

METHOD FOR DETOXIFYING PHOSPHIDE CONTAINING PESTICIDES

Werner Praxl, Rimbach, and Reiner Ehret, Weinheim, both of Fed. Rep. of Germany, assignors to Dr. Werner Freyberg, Laudenbach, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,420

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2648335

Int. Cl.[2] A01N *17/02;* C01B *25/08;* A01N *11/00*

U.S. Cl. 424—10 12 Claims

1. A method of detoxifying residues from phosphide containing phosphides of earth metals and alkaline earth metals which comprises treating such residues with water to which sufficient alkaline reagent has been added to produce a pH of at least 8.

4,180,558

UNIT DOSAGE FORMS

Arthur H. Goldberg, Montclair, and Michael L. Franklin, Parsippany, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 21, 1978, Ser. No. 935,274

Int. Cl.[2] A61K *9/70;* B32B *31/18*

U.S. Cl. 424—16 3 Claims

1. In a solid pharmaceutical unit dosage form comprising a laminate composed of a plurality of layers of an edible, therapeutically inert web, at least one of said layers having one or more medicaments loaded on to one or more surfaces, said layers of web arranged in said laminate so that substantially no medicament is loaded to an outer surface thereof, said laminate being sealed only at the edges so as to completely internalize said medicament, the improvement which comprises controlling the dissolution rate of said laminate by including therein at least one web of an improved paper composition formed from an aqueous alcholic fibrous slurry and consisting essentially of water-soluble carboxymethylcellulose fibers and water-insoluble, water-swellable, cross-linked carboxymethylcellulose fibers, said web by not greater than 20% soluble in water, the rate of disolution of said laminate being directly related to the density of said web of improved paper composition.

4,180,559

COATED 1-(2-CHLORODIBENZO[b,f]OXEPIN-10-YL)-4-METHYL-PIPERAZINE COMPOSITIONS

Harold E. Huber, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 867,167, Jan. 5, 1978, abandoned. This application Dec. 1, 1978, Ser. No. 964,008

Int. Cl.[2] A61K *9/36*

U.S. Cl. 424—35 5 Claims

1. A coated, duodenal soluble, pharmaceutical composition suitable for oral ingestion comprising a core having from 6 to 33% by weight of 1-(2-chlorodibenzo[b,f]oxepin-10-yl)-4-methylpiperazine or a pharmaceutically acceptable salt thereof, and from 67 to 94% by weight of an inert pharmaceutical carrier; and a duodenal soluble coating having from 7 to 15% by weight of said core of hydroxypropyl methylcellulose phthalate, said coating having a thickness of from 0.1 to 0.2 mm and which dissolves at a pH of about 5.0 to 5.5.

4,180,560

INERT CORE IMPLANT PELLET

Martin Katz, Los Altos Hills, and John S. Kent, Palo Alto, both of Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Continuation of Ser. No. 735,727, Oct. 26, 1976, Pat. No. 4,096,239, which is a continuation-in-part of Ser. No. 572,031, Apr. 28, 1975, abandoned. This application May 5, 1978, Ser. No. 903,284

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] A61K *9/22, 9/24*

U.S. Cl. 424—21 4 Claims

1. A solid, spherical, subcutaneously implantable pellet for producing a greater than normal weight gain in ruminants, which implantable pellet exhibits a substantially constant rate of release of active agent over a given time period and an abrupt termination of drug release at the end of said time period, said pellet comprising

(a) a biocompatible, inert, spherical core having a diameter of about 2 mm to about 10 mm and

(b) at least one biocompatible, biosoluble coating having a substantially uniform thickness of about 0.05 mm to about 1.0 mm intimately adhering to and completely covering said inert core, the composition of said coating comprising a substantially homogeneous mixture of (i) about 5% weight to about 90% weight of estradiol, estradiol benzoate, or mixtures thereof as the sole active agent(s), and (ii) about 10% weight to about 95% weight of a pharmaceutically suitable carrier which is solely a polyethylene glycol having a molecular weight of about 3000 to about 20,000, said inert, spherical core being at at least half the diameter of said spherical, implantable pellet.

4,180,561

HAIR PRESSING COMPOSITION

William L. Vinson, 6145 Vine St., Philadelphia, Pa. 19139

Filed Jan. 21, 1977, Ser. No. 761,044

Int. Cl.[2] A61K *7/09*

U.S. Cl. 424—71 12 Claims

1. In a hair pressing composition having a base comprising a mixture of petrolatum and lanolin, the improvement comprising an effective amount to hold hair in a styled condition and to impart a non-greasy feel and appearance to hair to which said composition is applied of a mixture of weeping willow extract prepared by placing split willow twigs in water, boiling said twigs and said water to form a solution of weeping willow juices in said water, and removing the twigs from said water, said solution being said weeping willow extract, and an extract from mustard greens and corn prepared by mixing together mustard greens with corn kernels, grinding said mustard greens and corn kernels and squeezing the extract from the ground mixture.

4,180,562

GLUTARALDEHYDE POLYMERIZED RAGWEED ANTIGEN E PREPARATION FOR TREATMENT OF ALLERGIC PATIENTS SENSITIVE TO RAGWEED POLLEN

Roy Patterson, Wilmette, Ill., and Floyd C. McIntire, Denver, Colo., assignors to Northwestern University, Evanston and Abbott Laboratories, North Chicago, both of, Ill.

Continuation-in-part of Ser. No. 788,049, Apr. 15, 1977, abandoned, Continuation of Ser. No. 358,223, May 8, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,966

Int. Cl.[2] A61K *39/36*

U.S. Cl. 424—91 **2 Claims**

1. A preparation for treatment of allergic patients sensitive to ragweed pollen, comprising ragweed antigen E polymerized with glutaraldehyde and being composed essentially of water-soluble polymers thereof of molecular weights from 200,000 to 20,000,000, said preparation being substantially free of unpolymerized ragweed antigen E and polymers thereof having molecular weights of less than 200,000.

4,180,563

IMMUNOSTIMULANT AGENT FROM *SALMONELLA TYPHIMURIUM* OR *LISTERIA MONOCYTOGENES* BACTERIAL CELLS AND PHARMACEUTICAL COMPOSITION

Robert Fauve, Sevres, France, assignor to Institut Pasteur, Paris, France

Division of Ser. No. 573,925, May 2, 1975, Pat. No. 4,076,801, which is a continuation of Ser. No. 317,022, Dec. 20, 1972, abandoned. This application Feb. 23, 1978, Ser. No. 880,511

Claims priority, application France, Dec. 24, 1971, 71.46520

Int. Cl.[2] A61K *39/02*

U.S. Cl. 424—92 **13 Claims**

1. An immunostimulant agent from bacterial cells of *Salmonella typhimurium* or *Listeria monocytogenes,* which immunostimulant promotes non-specific resistance to pathogens, and is

(a) soluble in chloroform;

(b) insoluble in water;

(c) free of the bacterial cell fractions which are not soluble in a solvent mixture of a halogenated hydrocarbon and an alcohol;

(d) a stimulant for the non-specific resistance of a human or animal host organism to a pathogen which has no antigenic relationship to the immunostimulant;

(e) capable of causing an increase of macrophages and lymphocytes of a host organism;

(f) effective against *Salmonella typhirium* in blood of so injected mice;

(g) effective against *Listeria monocytogenes* in liver and spleen of so injected mice;

(h) is effective against 10 times the LD_{50} of *Listeria monocytogenes* and 20 times the LD_{50} of *Salmonella typhimurium;*

(i) virtually free of toxicity; and

(j) is not capable of increasing the sensitivity of mice to bacterial endotoxins.

4,180,564

A-38533 ANTIBIOTICS AND PROCESS FOR PRODUCTION THEREOF

Otis W. Godfrey, Greenwood; Ronald D. Johnson, and Ralph E. Kastner, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 25, 1978, Ser. No. 909,582

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—117 **11 Claims**

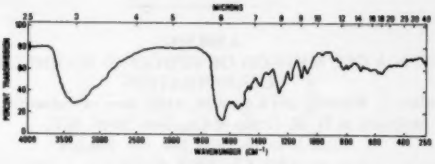
1. Antibiotic A-38533 factor A_1 which is a non-crystalline white powder having the following characteristics:

(a) an approximate elemental composition of 53.3–54.9 percent carbon, 5.5–5.7 percent hydrogen, 12.4–12.7 percent nitrogen, 24.3–25.6 percent oxygen and 3.3–3.8 percent sulfur;

(b) a molecular weight of about 840, as determined by mass spectrometry;

(c) a molecular formula of $C_{37}H_{44}N_8O_{13}S$;

(d) an infrared absorption spectrum in KBr pellet with significant absorption maxima at the following frequencies (cm^{-1}): 3363, 1665, 1593, 1552, 1518, 1465, 1396, 1363, 1268, 1185, 1112, 1073, 964, 887, 822, 792, 708, 635, 582, 555, and 490;



(e) five titratable groups in 66 percent aqueous dimethylformamide with pK_a values of approximately 5.93–6.02, 7.71–7.88, 10.80–10.90, 12.0–12.6, and greater than 13.0;

(f) ultraviolet absorption spectra, in acidic or neutral methanol, with absorption maxima at 256 nm (ε 21,500) and 222 nm (ε 28,500) and, in basic methanol, absorption maxima at 290 nm (ε 7,500), 260 nm (ε 22,400), and 242 nm (ε 35,500);

(g) is soluble in water, methanol, dimethyl sulfoxide, dimethylformamide, and in alcohol-water and tetrahydrofuran-water mixtures;

(h) gives the following color reactions:

Biuret	–
Folin	–
Anthrone	–
Dragendorff	–
Molish	+
Ehrlich	+
Sakaguchi	–
Ninhydrin	–
$FeCl_3$	–
Pauly	+

(i) contains (1) uracil and (2) hydroxyl and/or amino groups which are capable of acylation by standard procedures;

(j) an R_f value of approximately 0.55 on thin-layer chromatography using reverse-phase plates with fluorescent indicator (254 nm) and a 0.5 M citrate buffer (pH 4):methanol (1:1) solvent system;

or the acid addition or cationic salt of A-38533 factor A_1.

4,180,565

1-N-SUBSTITUTED DERIVATIVES OF 4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS

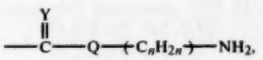
Alan K. Mallams, West Orange, N.J., and David H. Davies, Macclesfield, England, assignors to Schering Corporation, Kenilworth, N.J.

Filed May 25, 1978, Ser. No. 909,339

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **17 Claims**

1. A 1-N-X derivative of a 4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol, wherein X is



wherein

Y is O, S;

Q is O, NH;

n is 2–6;

with the provisos that:

(a) when Y is S, Q must be NH;

(b) Q and the NH_2 functional group cannot be attached to the same carbon atom;

and the pharmaceutically acceptable acid addition salts thereof.

16. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic, antibacterially effective amount of a compound of claim **1**.

4,180,566

SILICA GEL METHOD OF REDUCING BLOOD LIPID CONCENTRATION

Milton E. Winyall, and Kamal M. Abdo, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 15, 1978, Ser. No. 906,284

Int. Cl.[2] **A61K** *33/00*

U.S. Cl. 424—127 **11 Claims**

1. A method of reducing the lipid concentration in the blood of a patient in need of same which comprises orally administering to the patient silica gel in a lipid reducing effective amount of at least about 0.2 grams per kilogram of body weight.

4,180,567

IRON PREPARATIONS AND METHODS OF MAKING AND ADMINISTERING THE SAME

John R. Herb, Bethlehem, Pa., assignor to Pharmachem Corporation, Bethlehem, Pa.

Filed Sep. 2, 1977, Ser. No. 830,035

Int. Cl.[2] **A61K** *31/70*

U.S. Cl. 424—180 **5 Claims**

1. In a process for preparing an iron complex from a polymeric polyhydric compound selected from the group consisting of dextran, depolymerized dextran, dextrin, carboxyalkyl dextran, carboxyalkyl cellulose and alginates and a solution of an iron compound in a basic medium and at a temperature of 75°–100° C., the improvement which comprises activating said polyhydric compound by pretreatment with a base at a basic pH for about 0.5 to 1.0 hours and at a temperature of 85°–100° C., and then admixing said activated polyhydric compound with an aqueous solution of an iron compound consisting essentially of dialyzed iron.

5. A stable injectable iron dextran solution which is prepared by pretreating dextran in an aqueous solution with a base at a basic pH for about 0.5 to 1.0 hours at a temperature of 85°–100° C., so as to activate the dextran, adding to said solution a dialyzed aqueous solution of ferric hydroxide and then heating the mixture to a temperature between 95°–100° C., at a basic pH whereby a solution of an iron-dextran complex is obtained that can be utilized without further treatment.

4,180,568

CONTROL OF PHYTOPATHOGENS WITH CERTAIN 2,6-DINITROANILINES

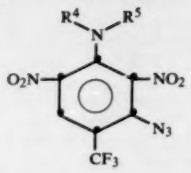
James R. Beck, Indianapolis, and Joseph A. Yahner, New Palestine, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 719,299, Aug. 31, 1976, Pat. No. 4,091,096, which is a continuation-in-part of Ser. No. 668,360, Mar. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 589,312, Jun. 23, 1975, abandoned. This application Feb. 16, 1978, Ser. No. 878,370

Int. Cl.[2] **A01N** *9/20*

U.S. Cl. 424—226 **7 Claims**

1. A method for reducing the incidence and severity of grape downy mildew which comprises applying to the foliage of the host plant a fungicidally-effective amount of a dinitroaniline compound having one of the following formulae:



(II)

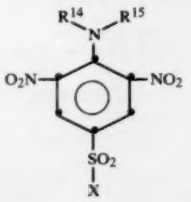
wherein

R^4 is H or C_1–C_3 alkyl;

when R^4 is H, R^5 is $N(R^6)_2$, C_1–C_7 normal or branched alkyl containing no tertiary carbon atoms, C_3–C_4 alkenyl or N-methyl-2-propionamido;

when R^4 is C_1–C_3 alkyl, R^5 is C_1–C_4 alkyl or C_3–C_4 alkenyl; and

each R^6 is independently C_1–C_3 alkyl;



(V)

wherein

X is N_3;

R^{14} is H, C_3–C_4 alkenyl or C_1–C_4 alkyl;

when R^{14} is H, R^{15} is C_3–C_7 secondary alkyl; and

when R^{14} is not H, R^{15} is C_1–C_5 alkyl, cyclopropylmethyl, C_5–C_6 cycloalkyl, C_3–C_4 alkenyl, halo C_2–C_3 alkyl or halo C_3–C_4 alkenyl.

4,180,569

SEED TREATMENT FUNGICIDES FOR CONTROL OF SEED-BORNE DISEASES

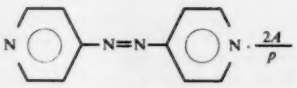
Steven J. Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 757,227, Jan. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 705,151, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 660,034, Feb. 20, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 920,079

Int. Cl.[2] **A01N** *9/20*

U.S. Cl. 424—226 **5 Claims**

1. A method for controlling fungi which infest seeds comprising applying to the seeds a fungicidally effective amount of a compound selected from the group consisting of 4,4′-azodipyridine and 4,4′-azodipyridinium acid salts of the formula



wherein

A is an acid having an acidic dissociation constant greater than 1×10^{-6}; and

p is equal to the number of hydrogens on the acid A which have an acidic dissociation constant greater than 1×10^{-6}.

4,180,570

17β-HYDROXY-4-ANDROSTEN-3-ONES AND PROCESS FOR THE PREPARATION THEREOF

Rudolf Wiechert; Dieter Bittler; Ulrich Kerb; Jorge Casals-Stenzel, and Wolfgang Losert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

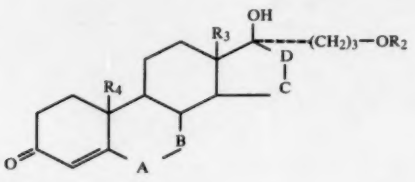
Filed May 10, 1978, Ser. No. 904,694

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722705; May 16, 1977, 2722706

Int. Cl.[2] C07J *1/00*

U.S. Cl. 424—243 **28 Claims**

1. A 17β-Hydroxy-4-androsten-3-one of Formula I



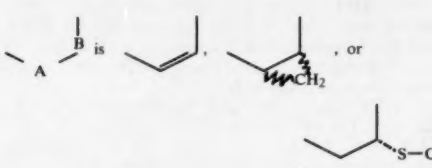
(I),

wherein

R_2 is hydrogen or the monovalent acyl radical of a monobasic or dibasic hydrocarbon carboxylic acid of up to 18 carbon atoms;

R_3 is methyl or ethyl;

R_4 is hydrogen or methyl;



wherein R_1 is lower alkyl; and

and when R_2 is the acyl radical of a dibasic acid, the physiologically acceptable salts thereof with the free acid moiety of the R_2 group.

28. A method of reversing the effect of desoxycorticosterone on the elimination of potassium and sodium which comprises administering a diuretically effective amount of a compound of claim **1**.

4,180,571

ARYLMALONAMIDO-1-OXADETHIACEPHALOSPORINS

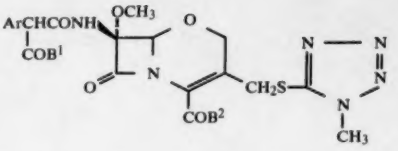
Masayuki Narisada, Ibaraki, and Wataru Nagata, Nishinomiya, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 780,183, Mar. 22, 1977, Pat. No. 4,138,486. This application Nov. 13, 1978, Ser. No. 959,784

Int. Cl.[2] A61K *31/41*; C07D *498/00*

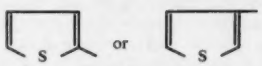
U.S. Cl. 424—248.52 **36 Claims**

1. A compound selected from the group consisting of (a) a compound of the formula



wherein

Ar is



COB^1 and COB^2 each is carboxy, methosycarbony, ethoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, t-butoxycarbonyl, pentyloxycarbonyl, cyclopropylmethoxycarbonyl, monohydroxy-t-butoxycarbonyl, 2, 2, 2-trichloroethoxycarbonyl, chloromethoxycarbonyl, cyanomethoxycarbonyl, methanesulfonylethoxycarbonyl, acetylmethoxycarbonyl, acetosymethoxycarbonyl, acetoxyethoxycarbonyl, propionyloxymethoxycarbonyl, propionyloxyethoxycarbonyl, pivaloyloxymethoxycarbonyl, benzoyloxymethoxycarbonyl, methoxymethoxycarbonyl, phenoxymethoxycarbonyl, methylthiomethoxycarbonyl, phenylthiomethoxycarbonyl, tetrahydropyranyloxycarbonyl, phthaliminomethosycarbonyl, α, α-dimethylpropargyloxycarbonyl, methoxycarbonyloxyethoxycarbonyl, ethoxycarbonylethoxycarbonyl, methoxycarbonyloxypropoxycarbonyl, allyloxycarbonyl, benzyloxycarbonyl, phenethyloxycarbonyl, tolylmethoxycarbonyl, dimethylbenzyloxycarbonyl, nitrobenzyloxycarbonyl, halobenzyloxycarbonyl, methoxybenzyloxycarbonyl, phthalidyloxycarbonyl, p-hydroxy-di-t-butylenzyloxycarbonyl, diphenylmethoxycarbonyl, trityloxycarbonyl, phenacyloxycarbonyl, chlorophenacyloxycarbonyl, bromophenacyloxycarbonyl, nitrophenacyloxycarbonyl, methylphenacyloxycarbonyl, trimethylsilyloxcarbonyl, dimethylmethoxysilyloxycarbonyl, trimethylstannyloxycaronyl, phenoxycarbony, naphthyloxycrbonyl, tolyloxycarbonyl, dimethylphenoxycarbonyl, nitrophenoxycarbonyl, methoxyphenoxycarbonyl, methanesulfonylphenoxycarbonyl, chlorophenoxycarbonyl, pentachlorophenoxycarbonyl, indanyloxycarbonyl, pyridyloxycarbonyl, sodiooxycarbonyl, potassiooxycarbonyl, magnesiooxycarbonyl, calciooxycarbonyl, or a sat of carboxy group with procain, xylocain, triethylamine, or dicyclohexylamine;

and (b) when at least one of COB^1 and COB^2 is carboxy, a pharmaceutically acceptable salt thereof.

16. A bactericidal composition comprising a bactericidally effective amount of a compound according to claim **1** and a pharmaceutical carrier.

4,180,572

LIPOGENESIS CONTROL BY ESTERS OF BENZOXAZINECARBOXYLIC ACIDS

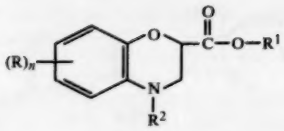
John B. Carr, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 791,758, Apr. 28, 1977, abandoned. This application ug. 25, 1978, Ser. No. 937,031

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—248.55 **9 Claims**

1. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally an effective amount of a compound of the formula:



wherein n is zero, one or two, with the following provisos: (1) when n is one, r is middle halogen, nitro, amino, methylsulfonylamino, trifluoromethyl, phenyl, or alkyl or alkoxy of from one to six carbon atoms, bonded to a carbon atom in the 6-, 7-, or 8- position of the molecule; (2) when n is two, (a) R is nitro or middle halogen, bonded to carbon atoms in the 6- and 7- positions of the molecule; or is, 6-nitro, 8-chloro; R^1 is alkyl of from one to four carbon atoms, and R^2 is hydrogen or phenalkyl.

4,180,573

1-PIPERAZINO-6-PHENYL-4H-S-TRIAZOLO[3,4-c]THIENO[2,3-e]1,4-DIAZEPINES

Karl-Heinz Weber; Adolf Langbein, both of Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Erich Lehr, Waldalgesheim; Karin Böke, Ingelheim am Rhein, and Franz J. Kuhn, Bingen, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

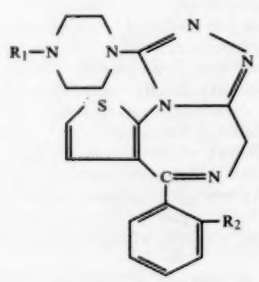
Filed Jul. 13, 1978, Ser. No. 924,149

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732921; Jul. 21, 1977, 2732943

Int. Cl.[2] **A61K** *31/495;* **C07D** *295/16, 295/08*

U.S. Cl. 424—250 **10 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkyl, halo-lower alkyl, hydroxy-lower alkyl, di(lower alkyl)amino-lower alkyl, phenyl, tolyl, methoxy-phenyl, nitro-phenyl, halo-phenyl, pyridyl, pyrimidinyl or —CO—R_4, where R_4 is hydrogen, alkyl or 1 to 17 carbon atoms, alkoxy of 1 to 2 carbon atoms, phenyl, tolyl, methoxy-phenyl, halo-phenyl, nitro-phenyl or pyridyl;

R_2 is hydrogen, fluorine, chlorine, or bromine; and

R_3 is chlorine, bromine or lower alkyl;

or, when R_1 is hydrogen, lower alkyl, hydroxy-lower alkyl, halo-lower alkyl or di(lower alkyl)amino-lower alkyl, a non-toxic, pharmacologically acceptable acid addition salt thereof.

9. An anxiolytic, tranquilizing, sedative or neuroleptic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anxiolytic, tranquilizing, sedative or neuroleptic amount of a compound of claim 1.

4,180,574

CERTAIN OVICIDAL PIPERAZINES

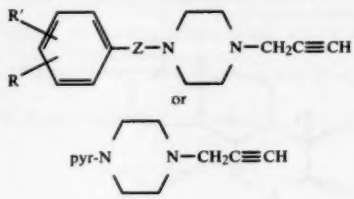
Robert G. Stein, Kenosha, Wis., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 26, 1978, Ser. No. 973,355

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 424—250 **9 Claims**

1. A method of combating the hatching of eggs of crop-damaging insects consisting essentially in applying to the habitat of said eggs an ovicidal amount of a compound of the formula



or

wherein "pyr" stands for 2-, 3-, or 4-pyridyl; Z is CO or $(CH_2)_n$; n is 0, 1 or 2; R is hydrogen, halogen, loweralkyl loweralkyloxy, nitro, or hydroxymethyl; and R′ is hydrogen or halogen, and simple acid addition salts thereof, together with an agriculturally acceptable carrier.

4,180,575

TRIAZOLIDINO-PYRIDAZINE-DIONES

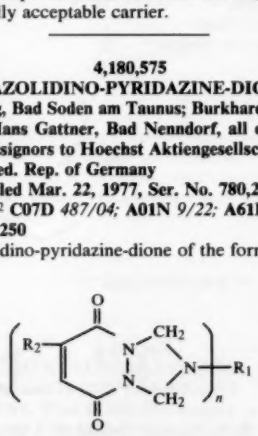
Hans Röchling, Bad Soden am Taunus; Burkhard Sachse, Kelkheim, and Hans Gattner, Bad Nenndorf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1977, Ser. No. 780,244

Int. Cl.[2] **C07D** *487/04;* **A01N** *9/22;* **A61K** *31/50*

U.S. Cl. 424—250 **8 Claims**

1. A triazolidino-pyridazine-dione of the formula



wherein n is an integer from 1 to 3,

R_2 is hydrogen or methyl, and wherein

(1) if n is 1, R_1 is an alkyl group having 1 to 18 carbon atoms, a cycloalkyl or methylcycloalkyl group having 5 to 8 carbon atoms, or a norbornylmethyl, hydroxyalkyl, alkoxyalkyl, or alkylmercaptoalkyl group each having 2 to 8 carbon atoms, or a phenyl, benzyl, or phenyl or benzyl group mono-substituted or di-substituted by a halogen, halogenalkyl, nitro, cyano, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-alkoxy group; or

(2) if n is 2, R_1 is a bivalent saturated aliphatic hydrocarbon group having 1 to 36 carbon atoms or a bivalent saturated aliphatic hydrocarbon group having 1 to 36 carbon atoms mono-substituted or di-substituted by halogen or by $(C_1–C_4)$-hydroxyalkyl, $(C_1–C_4)$-alkoxyalkyl, or $(C_1–C_4)$-alkylmercaptoalkyl groups, or R_1 is a bivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms or a bivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms mono-substituted or di-substituted by a $(C_1–C_4)$-alkyl group, or R_1 is phenylene or phenylene monosubstituted or di-substituted by a $(C_1–C_4)$-hydroxyalkyl, $(C_1–C_4)$-halogenalkyl, $(C_1–C_4)$-alkoxyalkyl, $(C_1–C_4)$-alkylmercaptoalkyl, $(C_1–C_4)$-alkyl, nitro, cyano, or halogen group; or

(3) if n is 3, R_1 is a trivalent saturated aliphatic hydrocarbon group having 3 to 36 carbon atoms or a trivalent saturated aliphatic hydrocarbon group having 3 to 36 carbon atoms mono-substituted or di-substituted by halogen, or by a (C_1–C_4)-hydroxyalkyl, (C_1–C_4)-alkoxyalkyl, or (C_1–C_4)-alkylmercaptoalkyl group, or R_1 is a trivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms or a trivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms mono-substituted or di-substituted by a (C_1–C_4)-alkyl group, or R_1 is a trivalent benzene ring or a trivalent benzene ring mono-substituted or di-substituted by a (C_1–C_4)-hydroxyalkyl, (C_1–C_4)-halogenoalkyl, (C_1–C_4)-alkoxyalkyl, (C_1–C_4)-alkylmercaptoalkyl, (C_1–C_4)-alkyl, nitro, cyano, or halogen group.

4,180,576

PURINES USEFUL FOR THE POTENTIATION OF ANTIBIOTICS

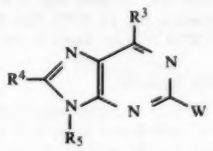
Geoffrey W. Grigg, Sydney, and Desmond J. Brown, Canberra, both of Australia, assignors to Commonwealth Scientific Industrial Research Organization, Sydney, Australia

Continuation-in-part of Ser. No. 613,879, Sep. 16, 1975, abandoned. This application Aug. 29, 1977, Ser. No. 828,875

Int. Cl.[2] **A61K** *31/505, 31/52;* **C07D** *473/36*

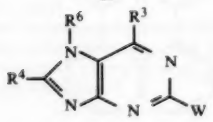
U.S. Cl. 424—251 **13 Claims**

1. A compound of the general formula:



I

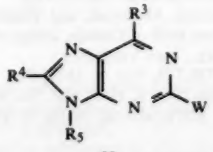
or



II

wherein: W is selected from the group consisting of —SR-$CONR^1R^2$, —SRCN, and —$SRCOR^1$; in which R is selected from the group consisting of —$(CH_2)_n$—, wherein n is an integer from 1 to 5, having at least one side chain alkyl group containing from 1 to 5 carbon atoms; wherein R^1 and R^2 are the same or different, and selected from the group consisting of hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms, and a branched chain alkyl group containing from 1 to 5 carbon atoms; and wherein R^3, R^4, R^5 and R^6, are the same or different, and selected from groups consisting of a hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms and a branched chain alkyl group containing from 1 to 5 carbon atoms; or a non-toxic salt thereof.

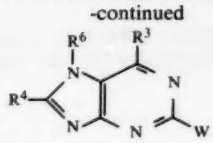
11. A method of treatment of tumors and bacterial infections which are normally responsive to the action of phleomycin, bleomycin, and mixtures thereof in an animal which comprises administering to the animal an effective amount of a compound selected from the group consisting of phleomycin, bleomycin, and mixtures thereof, prior to, simultaneous with or following administration of an amplifying amount of a compound of the formula:



I

or

-continued



II

wherein: W is selected from the group consisting of —SR-$CONR^1R^2$, —SCRN, and —$SRCOR^1$; in which R is selected from the group consisting of —$(CH_2)_n$—, where n is an integer from 1 to 5, and —$(CH_2)_n$—, wherein n is an integer from 1 to 5, having at least one side chain alkyl group containing from 1 to 5 carbon atoms; wherein R^1 and R^2 are the same or different, and selected from the group consisting of hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms, and branched chain alkyl groups having from 1 to 5 carbon atoms; and wherein R^3, R^4, R^5 and R^6, are the same or different and selected from the group consisting of a hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms and a brached chain alkyl group containing from 1 to 5 carbon atoms; or a non-toxic salt thereof.

4,180,577

FURO]2,3d]PYRIMIDINE DERIVATIVES AND ANTI-ULCER CONTAINING THE SAME

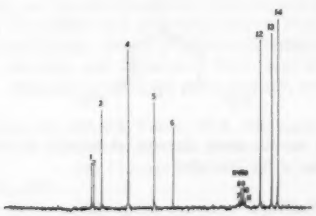
Sachiyuki Hamano, Tokyo, and Takaharu Nakamura, Chiba, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 829,862, Sep. 1, 1977, abandoned, which is a continuation of Ser. No. 739,449, Nov. 5, 1976, abandoned, which is a continuation of Ser. No. 557,889, Mar. 12, 1975, abandoned. This application May 2, 1978, Ser. No. 902,833

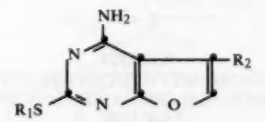
Claims priority, application Japan, Mar. 14, 1974, 49-28628

Int. Cl.[2] **A61K** *31/505;* **C07D** *491/04*

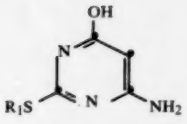
U.S. Cl. 424—251 **18 Claims**



1. A member selected from the group consisting of (a) a compound of the formula:



wherein R_1 represents lower alkyl of 1 to 4 carbon atoms, lower alkenyl of 2 to 4 carbon atoms, benzyl, phenethyl, or phenylpropyl and R_2 represents lower alkyl of 1 to 4 carbon atoms, unsubstituted phenyl or phenyl mono-substituted by carboxyl, methylsulfonyl, methoxycarbonyl or nitro, and (b) a corresponding pharmacologically acceptable acid-addition salt thereof, said compound being produced by the process which comprises the steps of reacting with heating up to reflux conditions a 2-substituted-mercapto-4-amino-6-hydroxy-pyrimidine of the formula:

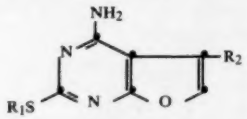


wherein R_1 has the same meaning as defined above, with an ω-haloketone of the formula:

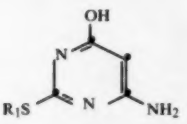
$$X—CH_2CO—R_2$$

wherein X represents halogen and R_2 has the same meaning as defined above, and if desired converting the resulting compound into its pharmacologically acceptable acid-addition salt.

2. A pharmaceutical composition as anti-ulcer, comprising a member selected from the group consisting of (a) a compound of the formula:



wherein R_1 represents lower alkyl of 1 to 4 carbon atoms, lower alkenyl of 2 to 4 carbon atoms, benzyl, phenethyl, or phenylpropyl, and R_2 represents lower alkyl of 1 to 4 carbon atoms, unsubstituted phenyl or phenyl mono-substituted by carboxyl, methylsulfonyl, methoxycarbonyl or nitro, and (b) a corresponding pharmacologically acceptable acid-addition salt thereof, said compound being produced by the process which comprises the steps of reacting with heating up to reflux conditions a 2-substituted-mercapto-4-amino-6-hydroxy-pyrimidine of the formula:



wherein R_1 has the same meaning as defined above, with an ω-haloketone of the formula:

$$X—CH_2CO—R_2$$

wherein X represents halogen and R_2 has the same meaning as defined above, and if desired converting the resulting compound into its pharmacologically acceptable acid-addition salt, and a pharmaceutical carrier.

4,180,578

2,4-DIAMINO-5-(4'-METHYLTHIO)BENZYLPYRIMIDENES, COMPOUNDS, COMPOSITIONS AND METHOD OF USE

Edgar Fritschi, Rothenbach; Walter Liebenow, Nuremberg, and Jaroslav Prikryl, Erlangen-Bruck, all of Fed. Rep. of Germany, assignors to Ludwig Heumann, & Co. GmbH, Nuremberg, Fed. Rep. of Germany

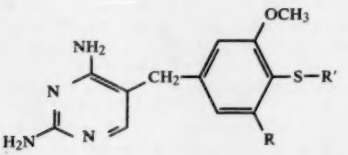
Filed Mar. 29, 1978, Ser. No. 891,266

Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720771

Int. Cl.[2] **C07D** *239/48;* **A61K** *31/505*

U.S. Cl. 424—251 **9 Claims**

1. A compound selected from a 2,4-diamino-5-thiobenzylpyrimidine of the formula:



I

in which R is selected from hydrogen, lower alkyl, lower alkoxy, and halogen, and R' is lower alkyl; and pharmacologically acceptable acid addition salts thereof.

9. A method for treating a bacterial infection in a patient which comprises administering an effective amount of a compound as claimed in claim 1 in combination with a sulphonamide.

4,180,579

2-SUBSTITUTED-1H-BENZ[de]-ISOQUINOLINE-1,3(2H)-DIONES

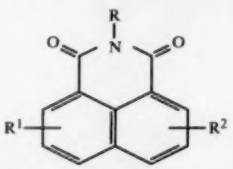
Peter C. Wade, Pennington, N.J., and Berthold R. Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 812,886, Jul. 5, 1977, Pat. No. 4,115,555, which is a division of Ser. No. 727,836, Sep. 9, 1976, Pat. No. 4,051,246. This application Jul. 12, 1978, Ser. No. 924,039

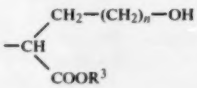
Int. Cl.[2] **C07D** *217/24;* **A61K** *31/47*

U.S. Cl. 424—258 **8 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkylthio, nitro, cyano, and trifluoromethyl; and R is



wherein n is 1 or 2 and R^3 is hydrogen, an alkali metal ion or an alkaline earth metal ion.

8. The method of treating inflammation in a mammalian specie comprising administering a composition containing a pharmaceutically acceptable carrier and as the active ingredient from about 1 mg./kg. to about 30 mg./kg. of a compound or mixture of compounds of claim 1.

4,180,580

FURO(3,4-B)QUINOLINES

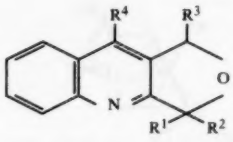
Christopher A. Demerson, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corp., New York, N.Y.

Division of Ser. No. 739,779, Nov. 8, 1976, Pat. No. 4,108,998. This application May 3, 1978, Ser. No. 902,463

Int. Cl.[2] **C07D** *405/02;* **A61K** *31/47*

U.S. Cl. 424—258 **11 Claims**

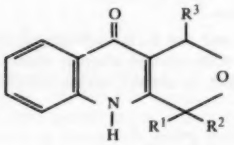
1. A compound of formula I



(I)

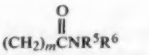
in which R^1 is lower alkyl; R^2 is lower alkyl; R^3 is hydrogen or lower alkyl; and R^4 is chloro, bromo, p-toluenesulfonyl or a radical of formula Y—X wherein Y is O and X is lower alkyl, phenyl, or a radical of formula Z—R^9 wherein Z is lower alkylene or hydroxy(lower)alkylene and R^9 is phenyl, or a therapeutically acceptable salt thereof.

6. A compound of formula VI



(VI)

in which R^1 is lower alkyl; R^2 is lower alkyl or a radical of formula



wherein m is an integer from 1 to 5 and R^5 and R^6 each is lower alkyl; and R^3 is hydrogen, lower alkyl or a radical of formula $(CH_2)_nNR^7R^8$ wherein n is an integer from 1 to 6 and R^7 and R^8 each is lower alkyl.

10. A method for treating microbial infections in a mammal which comprises administering to said mammal an effective antimicrobial amount of a compound of claim **1**, or a therapeutically acceptable salt thereof.

4,180,581

N-9,10-DIHYDROLYSERGYL-M-AMINOBENZOIC ACID AMIDE DERIVATIVE

Paul Stadler, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

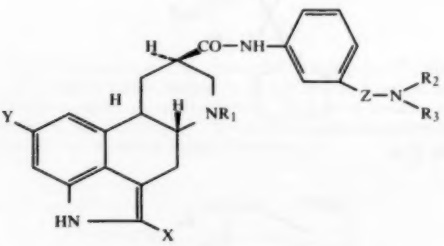
Filed Jan. 26, 1978, Ser. No. 872,639

Claims priority, application Switzerland, Jan. 28, 1977, 1070/77

Int. Cl.[2] **C07D** *457/06;* **A61K** *31/48*

U.S. Cl. 424—261 **21 Claims**

1. A compound of formula I,



I

wherein

X is hydrogen, chlorine or bromine and

Y is hydrogen or bromine, with the proviso that when X is chlorine Y is hydrogen,

Z is carbonyl or sulphonyl,

R_1 is alkyl of 1 to 4 carbon atoms, and

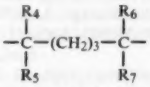
either (i)

R_2 is hydrogen or alkyl of 1 to 5 carbon atoms, and

R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, or phenyl,

or (ii)

R_2 together with R_3 is



wherein R_4, R_5, R_6 and R_7 are, independently, hydrogen or alkyl of 1 to 4 carbon atoms,

or (iii)

R_2 together with R_3 is

$$-(CH_2)_2-A-(CH_2)_2-$$

wherein A is a bond,

or a pharmaceutically acceptable acid addition salt thereof.

2. A pharmaceutical composition useful in the treatment of orthostatic hypotension or migraine comprising a therapeutically effective amount of a compound of claim **1** in association with a pharmaceutical carrier of diluent.

4,180,582

6-N-PROPYL-8-METHOXY-METHYL OR METHYLMERCAPTOMETHYLERGOLINES AND RELATED COMPOUNDS AS PROLACTIN INHIBITORS AND TO TREAT PARKINSON'S SYNDROME

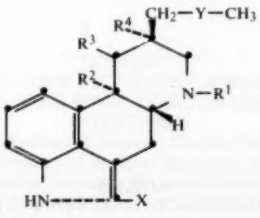
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 875,978, Feb. 8, 1978. This application Jan. 11, 1979, Ser. No. 2,515

Int. Cl.[2] **A61K** *31/48*

U.S. Cl. 424—261 **3 Claims**

1. A process for inhibiting the secretion of prolactin in mammals which comprises administering to a mammal in which there is an excess of prolactin being secreted a prolactin-lowering dose of a compound of the formula



wherein Y is O, SO, SO_2 or S, R^1 is ethyl, n-propyl, or allyl, X is H, Cl or Br and R^2, R^3 and R^4 when taken singly are hydrogen, and R^2 and R^3, and R^3 and R^4, when taken together with the carbon atoms to which they are attached, form a double bond, and pharmaceutically-acceptable acid addition salts thereof.

4,180,583

OLEFINIC 4-SUBSTITUTED PIPERIDINO DERIVATIVES AS THERAPEUTICS

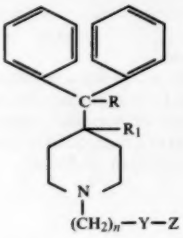
Albert A. Carr, Cincinnati, and C. Richard Kinsolving, Terrace Park, both of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 538,504, Jan. 6, 1975, abandoned, which is a continuation of Ser. No. 221,820, Jan. 28, 1972, Pat. No. 3,862,173. This application Apr. 3, 1978, Ser. No. 892,636

Int. Cl.[2] **A61K** *27/00, 31/40, 31/445, 31/495*

U.S. Cl. 424—267 **12 Claims**

1. A method of treating the symptoms of an allergic reaction in a patient comprising administering to said patient from about 0.01 to 20 milligrams per kilogram of body weight of the patient of a compound selected from a base of the formula



werein R and R_1 each represent hydrogen; or R and R_1 together from a second bond between the carbon atoms bearing R and R_1; n is a positive whole integer of from 1 to 3; Y is selected from the group consisting of —CH=CH— and

with the proviso that when each of R and R_1 represents hydrogen, Y represents —CH=CH—, n is equal to 1 or 2; Z is selected from the group consisting of thienyl, phenyl, and substituted phenyl wherein the substituents on the substituted phenyl may be attached at the ortho, meta, or para positions of the substituted phenyl ring and are selected from the group consisting of a halogen atom, a straight or branched lower alkyl chain of from 1 to 4 carbon atoms, a lower alkoxy group of from 1 to 4 carbon atoms, a di(lower)alkylamino group, and a saturated monocyclic heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino and N-(lower)alkylpiperazino; or a pharmaceutically acceptable acid addition salt thereof and a significant amount of a pharmaceutically acceptable carrier.

4,180,584

4-PYRROLIDINO-CYCLOHEXANONE KETALS

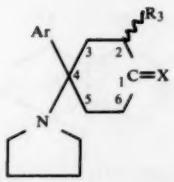
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 692,589, Jun. 3, 1976, Pat. No. 4,065,573. This application Oct. 11, 1977, Ser. No. 840,861

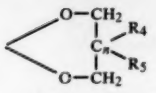
Int. Cl.[2] **C07D** *295/08, 295/10;* **H61K** *31/40*

U.S. Cl. 424—274 **6 Claims**

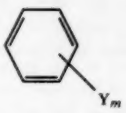
1. A compound of the formula:



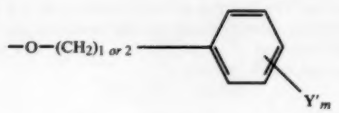
wherein X is



wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is thiophene, or

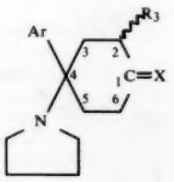


wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or

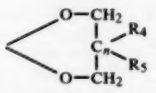


where Y′ is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof.

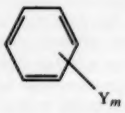
2. A pharmaceutical composition in unit dosage form comprising as an active ingredient an effective amount of a compound of the formula:



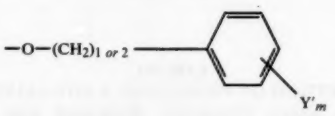
wherein X is



wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is thiophene, or

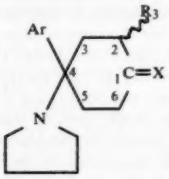


wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or

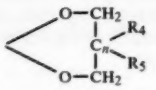


where Y' is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof, in association with a pharmaceutical carrier.

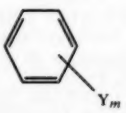
3. A process for inducing analgesia in humans and animals comprising the administration of an analgetic amount of a compound of the formula:



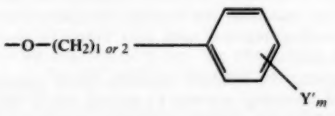
wherein X is



wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, $-CH_2$-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is thiophene, or



wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or



where Y' is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof, to a human or animal subject.

4,180,585

PHARMACOLOGICALLY ACTIVE ENOL ESTERS

Alexander C. Goudie, Harlow, England, assignor to Beecham Group Limited, England

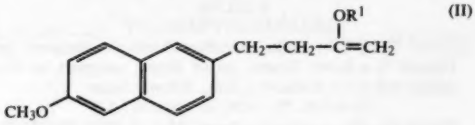
Filed Oct. 26, 1976, Ser. No. 735,738

Claims priority, application United Kingdom, Oct. 29, 1975, 44530/75

Int. Cl.[2] **A61K** *31/22;* **C07C** *69/145*

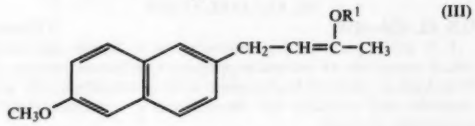
U.S. Cl. 424—311 **17 Claims**

1. An enol acylate of the formula



(II)

or



(III)

in which R^1 is alkanoyl of 2–4 carbon atoms.

4,180,586

3,4-DIPIVALYL-α-[METHYLAMINO)METHYL]BENZYL ALCOHOL AS AN ADJUNCT IN THE TREATMENT OF CIRCULATORY SHOCK

Stuart P. Eriksen, Santa Ana, Calif., assignor to Interx Research Corporation, Lawrence, Kans.

Filed Jan. 10, 1977, Ser. No. 758,354

Int. Cl.[2] **A61K** *31/22*

U.S. Cl. 424—311 **6 Claims**

1. A method for treating circulatory shock in a warm-blooded animal suffering from same which comprises parenterally administering thereto, a sympathomimetic effective amount of the compound, 3,4-Dipivalyl-α-[(methylamino)methyl]benzyl alcohol or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,180,587

UREYLENE PHENYLENE ANIONIC NAPHTHALENESULFONIC ACIDS AS COMPLEMENT INHIBITORS

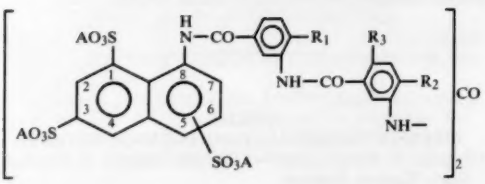
Gerald J. Siuta, Yonkers; Ransom B. Conrow, Pearl River; John F. Poletto, Nanuet, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 11, 1978, Ser. No. 923,743

Int. Cl.[2] **A61K** *31/185;* **C07C** *143/30*

U.S. Cl. 424—315 **24 Claims**

1. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:



wherein R_1, R_2, and R_3 are selected from the group consisting of hydrogen and methyl; with the proviso that R_1, R_2 and R_3 may not all be hydrogen; with the second proviso that when R_1 is methyl, then either R_2 or R_3 must also be methyl; and A is a pharmaceutically acceptable salt cation.

4,180,588

IMMUNOSUPPRESSANT

Takenori Mori, Takarazuka; Haruhisa Shirahama, Sapporo, and Tadashi Kurokawa, Sendai, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,238

Claims priority, application Japan, Mar. 9, 1977, 52/25698

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 **5 Claims**

1. A solid pharmaceutical composition in dosage unit form which comprises an immunosuppressively effective amount of N-(p-hydroxyphenyl)-L-glutamine or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable adjuvant.

4,180,589

PREPARATION OF A BLAND BEER

Etzer Chicoye, Milwaukee, Wis.; J. Raymond Helbert, Waukegan, Ill., and James F. Rice, Milwaukee, Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 750,509, Dec. 14, 1976, Pat. No. 4,068,005, which is a continuation-in-part of Ser. No. 622,001, Oct. 14, 1975, abandoned. This application Dec. 28, 1977, Ser. No. 865,358

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.[2] C12C *11/04*

U.S. Cl. 426—11 **3 Claims**

1. A method of preparing a lager beer having a mild, bland, less aromatic character which comprises placing beer wort in a fermentation vessel and fermenting the wort in said vessel for about 60 to about 200 hours at an elevated temperature of 60° F. to about 85° F. while maintaining the dissolved CO_2 concentration in the fermenting wort at about 2.1 to about 4.0 cc per cc of the fermenting wort by use of a CO_2 overpressure in the vessel of about 5 to about 40 psig.

4,180,590

METHOD OF PRODUCING SOY SAUCE

Yamashita Kazuo, Yotsukaichi; Kuroyanagi Koji, and Matsuo Naoki, both of Suzuka, all of Japan, assignors to Shono Denpun Kabushiki Kaisha, Suzuka, Japan

Filed Jul. 26, 1977, Ser. No. 819,203

Claims priority, application Japan, Oct. 28, 1976, 51-129758

Int. Cl.[2] A23L *1/238*

U.S. Cl. 426—18 **9 Claims**

1. A method for producing a seasoning liquor comprising the steps of: saccharifying starch contained in the raw material of a corn protein aqueous solution or dispersion by adding amylolytic enzyme to said corn protein aqueous solution or dispersion and performing said saccharification at 50°–60° C. for 20–50 hours.

performing lactic fermentation by adding lactic acid bacteria to adjust the pH of said raw material liquid to 4.0–5.0, deactivating said enzyme and pasteurizing said bacteria by heat treatment, and performing then the decomposition of protein and starch and alcohol fermentation at 25°–33° C. for 25–35 days in the presence of sodium chloride by adding koji and yeast, said koji containing the substrates of at least two members selected from the group consisting of corn starch, wheat, wheat bran and soybean, the amount of koji added being between about 1 to,3 times as much as the weight of protein contained in the liquid to which it is added, and the concentration of sodium chloride in the liquid is from 5–6% after the koji has been added.

4,180,591

METHOD OF PRODUCING A SOY SAUCE

Yamashita Kazuo, Yotsukaichi; Kuroyanagi Koji, Suzuka; Minamikawa Yoshitsugu, Suzuka, and Tanabe Yasuhiro, Suzuka, all of Japan, assignors to Shono Denpun Kabushiki Kaisha, Suzuka, Japan

Filed Jul. 26, 1977, Ser. No. 819,204

Claims priority, application Japan, Oct. 28, 1976, 51-129759

Int. Cl.[2] A23L *1/238*

U.S. Cl. 426—18 **7 Claims**

1. A method for producing a light-colored seasoning liquor of high nitrogen and alcohol contents comprising the steps of: performing lactic fermentation by adding lactic acid bacteria to the main raw material of a corn protein aqueous solution or dispersion containing starch to convert the pH of said raw material liquid to 4.0 to 5.0, then pasteurizing said raw material liquid by heat treatment, and performing the decomposition of protein and starch for 24–48 hours by adding a concentrated enzyme solution to the product of said lactic fermentation, and further performing decomposition of protein and starch and alcohol fermentation at 20°–30° C. for 20–35 days by adding yeast to the product, said concentrated enzyme solution being prepared by extracting the enzyme contained in koji soaking the koji in 2–4 fold quantity of 20–30 wt.% saline solution at 0°–5° C. for at least 24 hours, repeating said extraction at least twice, and concentrating thus obtained extract liquids by ultrafiltration to $\frac{1}{2}$–$\frac{1}{4}$ volume.

4,180,592

FOOD PROTEIN PRODUCT

Keith Buckley, Melton Mowbray; Alan Vernon, Nottingham, and Philip J. Lowe, Bramcote, all of England, assignors to Mars Limited, London, England

Filed Aug. 1, 1977, Ser. No. 820,890

Claims priority, application United Kingdom, Aug. 2, 1976, 32169/76

Int. Cl.[2] A23J *1/06;* **A23L** *1/31*

U.S. Cl. 426—32 **13 Claims**

1. A process of making a food product from whole blood or blood derivatives containing red cells or animal tissue containing such blood comprising the steps of:

treating said blood or derivative or tissue with an oxidizing agent in excess of the amount necessary for complete decolorizing reaction with said blood or derivative or tissue; and

decomposing the residual oxidizing agent remaining after said decolorizing reaction by adding whole blood or red blood derivatives or blood-containing animal tissue to the reacted mixture of said first mentioned blood or derivative or tissue and oxidizing agent.

4,180,593

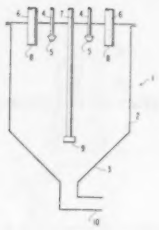
PROCESS FOR PRODUCING ROUND SPHERICAL FREE FLOWING BLOWN BEAD FOOD PRODUCTS OF CONTROLLED BULK DENSITY

Allan N. Cohan, 1143 Wright Dr., Huntingdon Valley, Pa. 19006

Filed Apr. 29, 1977, Ser. No. 792,384

Int. Cl.[2] A23L *1/30*; F26D *3/12*

U.S. Cl. 426—72 16 Claims



1. A process for producing food product in the form of round spherical free flowing blown beads which comprises:

A. providing sprayable, flowable composition containing an edible film forming food product, liquid in an amount sufficient to render the composition flowable, and a blowing agent; said blowing agent being present in said composition prior to the spraying step (B) below;

B. spraying said composition to atomize said composition to form beads;

C. subjecting said beads to a heated zone to therefore expand said beads by expansion of gases within the interior of said beads and to dry said beads; and

D. subjecting the expanding beads to a cooling zone to quench cool said beads to thereby stop the expansion of said beads and aid in the control of their bulk density.

4,180,594

CEREAL-BASED PRODUCT AND PROCESS FOR ITS PRODUCTION

Manfred P. Graf, Blonay, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Feb. 1, 1978, Ser. No. 874,351

Claims priority, application Switzerland, Feb. 7, 1977, 1450/77

Int. Cl.[2] A23L *1/164*

U.S. Cl. 426—560 2 Claims

1. A process for the production of a hard, granulated cereal-based product, comprising the steps of:

(a) dry mixing from 40 to 70% by weight cereal flakes, from 5 to 25% by weight sugar and from 10 to 20% by weight whey powder;

(b) working the mixture in a continuous malaxator with blades with addition of from 5 to 10% by weight edible oil and from 3 to 10% moisture at a temperature of from 110° to 150° C. to produce hard fragments;

(c) cooling the fragments obtained; and

(d) breaking said fragments into granulates.

4,180,595

NUTRITIVE SEAMOSS COMPOSITION AND METHOD FOR PREPARING SAME

Bernier Lauredan, 224-02 Linden Blvd., Cambria Hgts., N.Y. 11411

Filed Jun. 29, 1978, Ser. No. 919,503

Int. Cl.[2] A23L *1/04, 2/00*

U.S. Cl. 426—575 6 Claims

1. An edible seamoss composition which comprises in combination, water, gum arabic, dry linseed, seamoss, a sweetening agent and a flavoring agent, wherein the seamoss is Irish moss present in an amount of about 1.0 parts to about 1.6 parts by weight per 100 parts water, gum arabic is present in an amount from about 0.5 to about 0.8 parts by weight per 100 parts water, dry linseed is present in an amount from about 0.5 to about 0.8 parts by weight per 100 parts water, milk is additionally added in an amount of about 10 to about 40 parts by weight per 100 parts of water, the sweetening agent is added in an amount from about 1.5 to about 1.6 parts by weight per 100 parts water, and the flavoring agent is added in an amount of about 5 to 20 parts by weight per 100 parts by weight water.

4,180,596

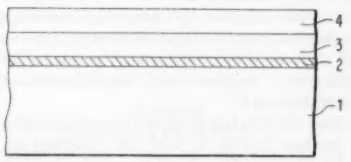
METHOD FOR PROVIDING A METAL SILICIDE LAYER ON A SUBSTRATE

Billy L. Crowder, Putnam Valley, and Stanley Zirinsky, Bronx, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,914

Int. Cl.[2] C23C *11/08, 11/00*

U.S. Cl. 427—42 23 Claims



1. A method for preparing metal silicide interconnections in an integrated circuit which comprises providing a layer of a metal silicide on a substrate wherein said metal is selected from the group consisting of molybdenum, tantalum, tungsten, rhodium, and mixtures thereof, by coevaporating said metal and silicon onto the desired substrate and then heat treating the coated substrate for a time sufficient for reacting deposited metal and deposited silicon to thereby obtain said metal silicide interconnections and wherein said interconnections are provided on the same side of the substrate as are electrically active devices.

4,180,597

MANUFACTURE OF MAGNETIC RECORDING MEDIA

Herbert Motz, Beindersheim; Norbert Schneider, Mutterstadt; Hans-Joerg Hartmann, Freinsheim, and Reinhold Baur, Offenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

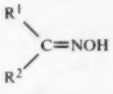
Filed Sep. 8, 1978, Ser. No. 940,462

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741341

Int. Cl.[2] H01F *10/02*

U.S. Cl. 427—48 10 Claims

1. A process for the manufacture of a magnetic recording medium which comprises forming a dispersion of finely divided particulate anisotropic magnetic material in a solution of polymeric binder in an organic solvent, the dispersion containing from 0.05% to 5% by weight, based on the amount of the magnetic material, of a compound of the formula (I)



(I)

wherein R^1 is methyl, straight-chain or branched alkyl of 2 to 10 carbon atoms, cycloalkyl of 6 to 10 carbon atoms or aralkyl of 7 to 14 carbon atoms and R^2 is hydrogen, methyl, straight-chain or branched alkyl of 2 to 10 carbon atoms, cycloalkyl of 6 to 10 carbon atoms or aralkyl of 7 to 14 carbon atoms; applying a layer of the dispersion to a non-magnetizable base; and

thereafter drying the layer of dispersion and magnetically orienting the particles of anisotropic magnetic material of said dispersion, said drying and orienting steps being effected in any order provided that the magnetic layer has not solidified prior to orientation of the particles.

4,180,598

RADIATION-CURABLE COATING COMPOSITIONS AND METHOD OF COATING METAL SUBSTRATES THEREWITH

William D. Emmons, Huntingdon Valley, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 924,263, Jul. 13, 1978, abandoned. This application Aug. 11, 1978, Ser. No. 933,010

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—44 **22 Claims**

1. A readiation-curable composition, characterized by improved adhesion to metal substrates, having a film-forming binder consisting essentially of:

(A) At least one ethylenically unsaturated monomer selected from the group consisting of isobornyl acrylate, 2-ethylhexyl acrylate, ethoxyethoxyethyl acrylate, dicyclopentenyloxyethyl acrylate and dicyclopentenyloxyethyl methacrylate, and

(B) At least one acrylated oligomeric condensation or addition product having at least two terminal or pendant acryloxy groups of the formula

$H_2C{=}C(H)C(O)O{-}$,

and about 1% to 15% by weight, based on the total weight of (A) and (B), of 3-acryloxypropionic acid.

10. A method for coating a metal substrate, which comprises preparing a radiation-curable composition as defined in claim **1**, applying a thin film of the composition to the surface of a substrate, and then subjecting the film to actinic radiation for a length of time sufficient to cure the film.

4,180,599

CROSSLINKING PHOTOINITIATORS OF ACRYLIC BENZOPHENONETETRACARBOXYLATES

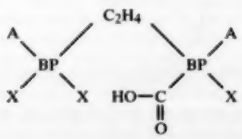
Stephen M. Wolpert, Detroit, and Gustav J. Nerath, Canton, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1978, Ser. No. 937,681

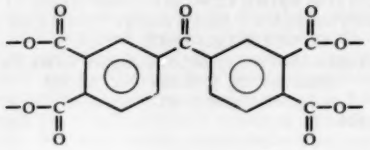
Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—54.1 **1 Claim**

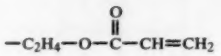
1. A method of forming an acrylic polymeric coating on a substrate comprising the steps of (1) formulating an acrylic monomer coating material to include as the sole reactive crosslinking ingredient and as the sole photosensitizing catalyst, an acrylic benzophonenetetracarboxylate derivative, (2) forming a film of said coating material on the substrate, and (3) subjecting said film to ultraviolet light so that the acrylic moieties in said carboxylate derivative are permitted to form network cross linkages after catalytic initiation by the benzophenone moiety; the acrylic benzophenonetetracarboxylate derivative having the formula:



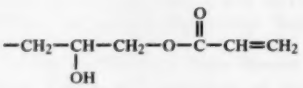
where BP is



and A is



and X is



4,180,600

PROCESS USING ACTIVATED ELECTROLESS PLATING CATALYSTS

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540, assignor to Nathan Feldstein, Princeton, N.J.

Continuation-in-part of Ser. No. 820,904, Aug. 1, 1977, Pat. No. 4,131,699, which is a continuation of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354. This application Sep. 11, 1978, Ser. No. 941,044

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—97 **31 Claims**

1. A process for electroless or chemical plating onto a nonconductor substrate comprising the step of contacting said substrate with an activated colloidal dispersion wherein said colloidal dispersion comprises a metal which in one of its oxidation states is capable of electroless or chemical plating initiation and wherein said metal may be in an elemental state or alloy or compound and mixtures thereof and further wherein said activated colloidal dispersion comprises at least one primary stabilizer which alone renders the dispersion weakly active and at least one reactivity modifier and wherein said primary stabilizer and said reactivity modifier are inherently colloid stabilizers however they are different materials.

4,180,601

METHOD OF APPLYING LIQUID TO SOLID SURFACES

Floyd B. Kopis, 330 Interstate Rd., Addison, Ill. 60101

Continuation of Ser. No. 506,355, Sep. 16, 1974, abandoned. This application May 9, 1977, Ser. No. 794,810

Int. Cl.[2] B05D *7/22*

U.S. Cl. 427—238 **2 Claims**

1. A method of applying a liquid to an inner surface of an opening having an up and down orientation in an object, said method comprising:

providing an elongated tubular applicator having a completely exposed exterior surface and an interior return passage extending longitudinally in said applicator,

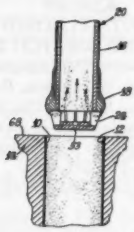
positioning said applicator with an up and down orientation,

supplying a layer of the liquid continuously to said exposed exterior surface and thereby causing the liquid layer to flow downwardly solely by gravity along said exposed exterior surface with one side of said liquid layer retained on said exposed exterior surface solely by adhesion between said liquid and said exposed exterior surface and with the other side of said liquid layer completely exposed to the outside,

outwardly deflecting the downwardly flowing liquid layer along said exposed exterior surface and thereby forming an outwardly projecting annular bead of the liquid,

sucking excess liquid from said exposed exterior surface and into said interior passage in said applicator below said bead to prevent dripping of the liquid from said applicator,

inserting said applicator into said opening to bring said bead of liquid into contact with said inner surface of said opening,



producing relative longitudinal movement between said applicator and said inner surface while maintaining said bead of liquid in contact with said inner surface to apply the liquid thereon,

said exposed exterior surface of said applicator being maintained out of contact with said inner surface of said opening,

and reversing said relative longitudinal movement to cause withdrawal of said applicator from said opening.

4,180,602

ELECTROLESS PLATING OF POLYVINYLIDENE FLUORIDE

Lawrence M. Schiavone, Howell, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1978, Ser. No. 892,107

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—306 **9 Claims**

1. A process for electroless plating a substrate comprising the steps of exposing said substrate first to a pretreatment, then to a sensitizer and finally to a plating solution CHARACTERIZED IN THAT said substrate. is polyvinylidene fluoride, said pretreatment is a nonoxidizing solvent for said substrate and said sensitizer is elemental silver.

4,180,603

COATING BATH COMPOSITION AND METHOD

John K. Howell, Jr., Rochester, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Jan. 31, 1977, Ser. No. 764,120

Int. Cl.[2] B05D *1/18, 3/02;* **C08J** *3/00;* **C08L** *00/00*

U.S. Cl. 427—353 **9 Claims**

1. The method of applying a bonded organic coating to a ferrous substrate comprising the steps of:

(1) combining an epoxy resin, a cross linking resin, a resin-miscible water-immiscible solvent and at least one emulsifying agent wherein the weight ratio of epoxy resin: cross linking resin is from about 1:1 to about 9:1;

(2) adding sufficient water and hydrogen peroxide to the combination of step 1 to yield an emulsion having a solids content of from about 5 to about 500 grams per liter and containing from about 1 to about 5 grams per liter of hydrogen peroxide as an oxidizing agent;

(3) adding sufficient acid or base, if necessary, to adjust the pH value of the emulsion to from about 2 to about 4;

(4) immersing a ferrous substrate into the coating bath to form a coating thereon; and

(5) heat curing the coating.

4,180,604

TWO LAYER RESIST SYSTEM

Bai-Cwo Feng, Wappingers Falls, and George C. Feng, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,814

Int. Cl.[2] B05D *1/36;* **G03C** *1/74*

U.S. Cl. 430—270 **8 Claims**

1. A method for forming a composite layer of resist materials comprising:

providing first and second resist materials, each resist material being a sensitized organic polymer capable of forming a patterned resist mask to protect the underlying portions of a substrate;

saturating said second resist material with a dilutant which does not dissolve said first resist material;

applying said first resist material atop said substrate; and

applying said saturated resist material atop said first material, thereby forming said composite layer.

4,180,605

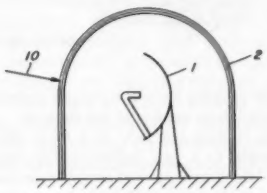
MULTILAYER RADOME

Daniel E. Gilbert, Maple Valley; James R. Lee, Seattle, and Ted J. Kramer, Auburn, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 8, 1978, Ser. No. 931,660

Int. Cl.[2] G21F *1/06, 1/12*

U.S. Cl. 428—76 **4 Claims**



1. A radome for protection of antennas subject to damage from incident irradiation which comprises a plurality of boron nitride layers in spaced relation with spaces between the layers evacuated.

4,180,606

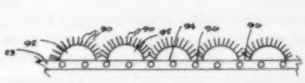
FABRICS HAVING FLOCKED CORDUROY RIBS

Charles M. Hance, Woodruff, and Charles D. Martin, Greer, both of S.C., assignors to M. Lowenstein & Sons, Inc., New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,457

Int. Cl.[2] B32B *33/00*

U.S. Cl. 428—88 **17 Claims**



10. A textile fabric comprising a flexible substrate sheet, a plurality of substantially parallel, closely spaced, raised ribs of adhesive material extending along and secured to one surface of said sheet, each of said ribs being defined in transverse cross-section by opposed side surfaces sloping upwardly and inwardly from said sheet surface to the top of the rib, and a plurality of closely spaced, discrete fibers of predetermined

length adhesively embedded in and extending outwardly from the overall exposed surface of each of said ribs of adhesive, with surface portions of said sheet between said ribs of adhesive being substantially free of adhesive and said fibers to provide an appearance in said fabric substantially similar to woven corduroy.

4,180,607

EPOXY RESIN COMPOSITION AND METHOD FOR CURING THE EPOXY RESIN COMPOSITION

Ichiro Sasaki; Hiroshi Itatani, and Mikito Kashima, all of Chiba, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Aug. 31, 1978, Ser. No. 938,526
Claims priority, application Japan, Jul. 7, 1978, 53-81943
Int. Cl.[2] C08G *59/42*
U.S. Cl. 528—112 **24 Claims**

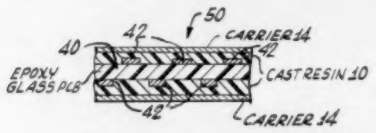
1. An epoxy resin composition comprising at least one epoxy resin and a curing agent which comprises, as an essential curing component, 2,3,3',4'-biphenyltetracarboxylic dianhydride.

4,180,608

PROCESS FOR MAKING MULTI-LAYER PRINTED CIRCUIT BOARDS, AND THE ARTICLE RESULTING THEREFROM

Joseph A. Del, 16326 Barneston St., Granada Hills, Calif. 91344

Continuation of Ser. No. 757,753, Jan. 7, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 922,758
Int. Cl.[2] B32B *7/06, 31/00*
U.S. Cl. 428—196 **9 Claims**



1. A process for making a multi-layer printed circuit board (PCB) which includes, in sequence, the steps of:

first laminating at least one side of a PCB provided with circuitry details, to a cast thermosetting resin layer, of about 3–6 mil thickness, carried on a release-coated carrier sheet, said cast thermosetting resin layer comprising essentially a first, B-staged, epoxy resin system solid at room temperatures, said first laminating step proceeding at temperatures and/or times substantially below curing conditions of said cast thermosetting resin layer to form a prefilled PCB laminate including said release-coated carrier sheet wherein said cast thermosetting resin layer remains B-staged;

second, removing said release-coated carrier sheet;

third, assemblying at least one of said prefilled PCB laminates with prepreg layers, each prepreg layer comprising glass cloth impregnated by a second B-staged epoxy resin system compatible with said first B-staged epoxy resin system of said cast thermosetting resin layer, said prepreg layer having a resin flow, under standard conditions, that is less than the resin flow of said cast thermosetting resin layer; and

fourth, laminating each of said prefilled PCB laminates and said prepreg layers, under curing conditions, to cure the B-staged thermosetting resins in said prefilled PCB laminates and prepreg layers and form a fully cured essentially void-free multi-layer PCB.

5. In the process for making a multi-layer printed circuit board (PCB) the improvement which comprises the steps of:

laminating at least one side of a PCB, which is provided with circuitry details, to a cast thermosetting resin layer, of about 3–6 mil thickness, carried on a release-coated carrier sheet, said thermosetting resin layer comprising essentially a B-staged, epoxy resin system having a resin flow, under curing conditions, greater than a prepreg layer containing glass cloth impregnated by said B-staged resin, said laminating step proceeding at temperatures and/or times substantially below curing conditions to form a prefilled PCB laminate including said release-coated carrier sheet wherein the cast resin layer remains B-staged, and prior to the lamination of multiple PCB layers; and removing said release-coated carrier sheet.

7. The product formed by the process of claim 1.

4,180,609

ARTICLE COATED WITH FLUOROPOLYMER FINISH WITH IMPROVED SCRATCH RESISTANCE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 701,746, Jun. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 595,175, Jul. 11, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,668
Int. Cl.[2] B32B *7/00;* **C08L** *27/18;* **B32B** *27/00*
U.S. Cl. 428—212 **17 Claims**

1. An article bearing a basecoat derived from a composition comprising:

(a) a particulate polymer polymerized or copolymerized from monomers selected from one or more monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms;

(b) mica particles, mica particles coated with pigment, or metal flake; and

(c) a liquid carrier;

overlaid with a topcoat finish derived from a composition comprising (a), (b) and (c), with the concentration of (b) in the topcoat being from 10% to 90% of the concentration of (b) in the basecoat.

17. A method for improving the apparent scratch resistance of an article bearing a basecoat derived from a composition comprising:

(a) a particulate polymer polymerized or copolymerized from monomers selected from one or more monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms or a combination of fluorine atoms or chlorine atoms;

(b) mica particles, mica particles coated with pigment, or metal flake;

(c) a polymer of monoethylenically unsaturated monomers which depolymerizes and whose depolymerization products vaporize in the temperature range of about 150° C. below the fusion temperature of (a) to about the decomposition temperature of (a); and

(d) a liquid carrier;

the method comprising topcoating the basecoat with a composition comprising (a), (b), (c) and (d), wherein the concentration of (b) in the topcoat is from 10% to 90% of the concentration of (b) in the basecoat, and then fusing the coatings.

4,180,610

ARTICLE COATED WITH A WATER BASED ALKYD RESIN PRIMER

Monica H. Verma, Troy, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 858,183, Dec. 7, 1977, Pat. No. 4,116,904, and a continuation-in-part of Ser. No. 738,855, Nov. 4, 1976, abandoned. This application May 15, 1978, Ser. No. 905,968
Int. Cl.[2] B32B *9/04*
U.S. Cl. 428—216 **8 Claims**

1. An article comprising a substrate coated with a 0.1–5 mil thick layer of the dried coalesced primer composition wherein the primer is from an aqueous composition comprising 5–50%

by weight of a film-forming binder and 50–90% by weight of an aqueous medium; wherein the binder consists essentially of

an alkyd resin which is the esterification product of soya oil fatty acids, phthalic acid, trimellitic anhydride and trimethylol propane having an acid number of 20-100; and

the composition contains pigment in a pigment to binder weight ratio of about 300/100 to 10/100 in which the pigment is a mixture of talc, barytes and zinc/calcium molybdate and

about 0.05–1.0% by weight, based on the weight of the composition, of an anionic polyelectrolyte dispersant;

the composition containing sufficient ammonia or an amine to provide the composition with a pH of 6.5–8.5.

4,180,611
SMOOTH-SURFACED NONWOVEN FABRIC

Wolfram Schultheiss, Birkenau, and Klaus Schmidt, Hirschberg, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Hohnerweg, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,564

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655024

Int. Cl.[2] **B32B** *5/16, 27/02*

U.S. Cl. 428—288 **4 Claims**

1. A nonwoven fabric having a smooth surface, especially for use as a support material for a semipermeable membrane, comprising a support mat having at least one surface into which there has been calendered an open structured porous covering layer of fine flat fibers having a thickness of less than about 30×10^{-6} m, the covering layer having a specific weight of about 1 to 200 g/m^2 and having been formed by electrostatically spinning the fibers directly onto the support mat, the support mat extending over the entire width of the fabric.

4. In a system for filtration using a semipermeable membrane, the improvement which comprises using said membrane supported on a nonwoven fabric according to claim 1.

4,180,612
HYDANTOIN-POLYESTER COATING COMPOSITIONS

Denis R. Pauzé, Scotia, N.Y., and Donald G. Pucci, West Lafayette, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 447,624, Mar. 4, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 540,633

Int. Cl.[2] **C08G** *18/64, 63/68, 63/70, 73/16*

U.S. Cl. 528—289 **15 Claims**

1. A coating composition comprising a polyester hydantoin containing free carboxyl groups, at least part of the free carboxyl groups in the polyester moiety being neutralized with a compound selected from the group consisting of an amine, ammonia, and ammonium hydroxide.

4,180,613
CRAZE-RESISTANT POLYSILOXANE RESIN COATINGS AND COATING COMPOSITIONS CONTAINING A DISCONTINUOUS PHASE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 829,824, Sep. 1, 1977. This application Mar. 31, 1978, Ser. No. 892,299

Int. Cl.[2] **B32B** *5/16, 27/00;* **B05D** *3/02*

U.S. Cl. 428—327 **21 Claims**

1. A coated substrate having a coating consisting essentially of a continuous phase of a cross-linked polysiloxane resin which has dispersed throughout it about 5–30% by weight of a discontinuous particulate phase of an organic modifier, based on the combined weight of the resin and the modifier,

wherein the modifier has an average particle size in the range of 0.1–15 μm, the modifier is tougher than the coating, and the modifer has a higher static coefficient of friction against the polysiloxane resin than does polytetrafluoroethylene, and wherein the polysiloxane resin has a degree of elongation not greater than about 4%.

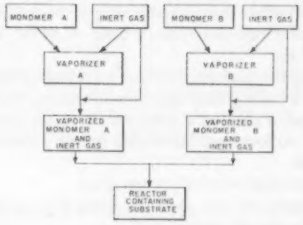
4,180,614
GAS-BARRIER COATED FILMS, SHEETS OR FOILS AND METHOD OF PREPARATION

Rudolph J. Angelo; Richard N. Blomberg, both of Wilmington; Fritz P. Boettcher, Newark, all of Del.; Richard M. Ikeda, Chadds Ford, Pa., and Michael R. Samuels, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 630,996, Nov. 12, 1975, Pat. No. 4,104,438, which is a continuation-in-part of Ser. No. 542,237, Jan. 20, 1975, abandoned. This application Dec. 16, 1977, Ser. No. 861,567

Int. Cl.[2] **B32B** *27/34, 27/28, 27/36, 27/08*

U.S. Cl. 428—336 **57 Claims**



1. A process for forming a gas-barrier coating on a film, sheet or foil, said coating being an aromatic polyamide, polyimide, polyamide-imide, polyhydrazide, polyamidehydrazide or polyazomethine formed by the direct vapor-phase condensation polymerization of their respective monomers, which process comprises vaporizing said monomers, mixing said vaporized monomers in the presence of an inert diluent gas and reacting said mixed monomers in a reaction zone, in the presence of said film, sheet or foil maintained above the critical minimum deposition temperature of said monomers but below about 300° C., and forming the condensation polymer on the surface of said film to a thickness between about 0.01 and about 0.6 mil.

28. A film, sheet or foil having a gas-barrier coating thereon of an aromatic polyamide, polyimide, polyamide-imide, polyhydrazide, polyamide-hydrazide or polyazomethine formed onto said film by the direct vapor-phase condensation polymerization of their respective monomers mixed in the vapor state and reacted in the presence of said film, sheet or foil maintained above the critical minimum deposition temperature of said monomers but below about 300° C., said coating having a thickness between about 0.01 and about 0.6 mil.

4,180,615
VINYL TILE AND PRODUCTION THEREOF

Philip S. Bettoli, Martinsville, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 848,898, Nov. 7, 1977, abandoned, Division of Ser. No. 347,480, Apr. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 215,197, Jan. 3, 1972, abandoned. This application May 19, 1978, Ser. No. 907,724.

Int. Cl.[2] **B05D** *3/06*

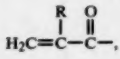
U.S. Cl. 428—339 **21 Claims**

1. A continuous process for producing an improved vinyl tile comprising:

(a) calendering a uniform mix comprising filler, vinyl chloride polymer and plasticizer to form a continuous vinyl sheet having a thickness of from about 1/16" to about ¼", said continuous sheet being discharged from the calendering zone at a travel rate of at least about 80 ft./min.;

(b) coating the thus-formed continuous vinyl sheet traveling

essentially at said travel rate with a layer between about 1 and about 5 mils thick of a substantially solvent free fluid coating composition having a volatility of less than about 2percent and comprising urethane compound having at least two photo-polymerizable ethylenically unsaturated groups of the general structure:



where R is either H or CH_3, said layer of coating composition being capable of curing upon exposure to ultraviolet light to form a hard, clear layer adherent to said vinyl sheet;

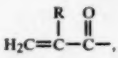
(c) exposing the thus-coated sheet traveling essentially at said rate of at least about 80 ft/min. to ultraviolet light having wavelengths within the range of from about 2500 Å to about 4000 Å at a temperature of from about 110° F. to about 220° F., the radiation intensity level being sufficient to initiate the desired curing of the coating within an ultraviolet exposure time of from about 0.2 sec. to about 15 sec. and

(d) passing the thus-treated sheet traveling essentially at said rate to a cutting zone and therein cutting the thus-coated and treated sheet at a temperature of not less than about 120° F. to form individual tiles having a clear wear layer thereon.

6. An improved vinyl tile comprising:

(a) thermoplastic base tile comprising filler, vinyl chloride, polymer and plasticizer; and

(b) a clear, durable wear layer adhering to the surface of said base tile and having a thickness of from about 1 to about 5 mils, said wear layer comprising urethane compound photo-polymerized by an exposure to ultraviolet light at from about 110° F. to about 220° F. for from about 0.2 to about 15 sec., said wear layer being photo-polymerized from a fluid coating composition having a volatility of less than about 2 percent and comprising urethane compound having at least two photo-polymerizable ethylenically unsaturated groups of the general structure:



where R is either H or CH_3.

4,180,616

SOFT SOLDERING

David G. Lovering, and James H. Turnbull, both of Swindon, England, assignors to Multicore Solders Limited, Hertfordshire, England

Filed Nov. 25, 1977, Ser. No. 854,702

Claims priority, application United Kingdom, Nov. 25, 1976, 49284/76

Int. Cl.² B23K *35/34*

U.S. Cl. 428—389 **7 Claims**

1. A soldering composition for use in soft soldering processes, the composition comprising (a) a soft solder alloy and (b) a flux composition comprising as an essential active flux material at least one compound containing a perhydro-1,2-cyclopentanophenanthrene ring system.

4,180,617

HYGROSCOPIC FIBERS AND FILAMENTS

Ulrich Reinehr, Dormagen; Hermann-Josef Jungverdorben, Grevenbroich, and Toni Herbertz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 746,727, Dec. 2, 1976. This application Jul. 29, 1977, Ser. No. 820,240

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554124; Apr. 28, 1977, 2719019

Int. Cl.² D02G *3/00*

U.S. Cl. 428—398 **10 Claims**

1. A hydroscopic filament or fiber of a fiber-forming synthetic polymer having a water permeable sheath and a microporous core in which both the sheath and the core contain voids, the voids in the core forming an interconnected system open to liquids through voids in the sheath, and in which the average size of the voids in the core is at most 10,000 A and is significantly larger than the size of the voids in the sheath; a water retention capacity of at least 10%; a porosity of at least 10%; and a fiber swellability of at most 10% which is lower than the water retention capacity.

4,180,618

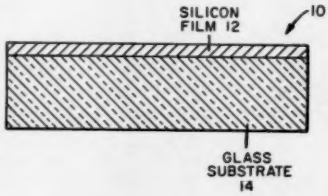
THIN SILICON FILM ELECTRONIC DEVICE

James W. Alpha, Corning, and William H. Dumbaugh, Jr., Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 27, 1977, Ser. No. 819,264

Int. Cl.² B32B *17/06*; B05D *5/12*

U.S. Cl. 428—428 **6 Claims**



1. In an electronic device wherein a thin film of silicon is deposited on a substrate, the improvement wherein the substrate is an aluminosilicate glass having a linear coefficient of thermal expansion over the temperature range of 0°–300° C. of between $32–42 \times 10^{-7}$/°C., an annealing temperature in excess of 800° C., and a viscosity at the liquidus temperature of at least about 100,000 poises, said glass consisting essentially, in percent by weight as calculated from the glass batch on an oxide basis, of 55 to 75% SiO_2, 5 to 25% Al_2O_3, and at least one alkaline earth metal oxide selected from the group consisting of 9 to 15% CaO, 14 to 20% SrO, 18 to 26% BaO, and a mixture of such oxides wherein the total alkaline earth metal oxide content is equivalent on a molar basis to 9 to 15% CaO.

4,180,619
CROSSLINKED ACRYLIC POLYMER MICROPARTICLES

Joseph M. Makhlouf, Mars, and Samuel Porter, Jr., Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 805,679, Jun. 13, 1977, which is a continuation-in-part of Ser. No. 559,949, Mar. 19, 1975, abandoned. This application Aug. 16, 1978, Ser. No. 934,109

Int. Cl.[2] **C08F** *220/06*

U.S. Cl. 526—202 **12 Claims**

1. Crosslinked acrylic polymer microparticles having a particle size of from 0.1 to 10 microns, which crosslinked acrylic polymer particles may be produced by free radical addition copolymerizing from 0.5 to 15 percent of alpha, beta-ethylenically unsaturated monocarboxylic acid, from 70 to 99 percent of at least one other copolymerizable monoethylenically unsaturated monomer and from 0.5 to 15 percent of crosslinking monomer selected from the group consisting of (1) epoxy group-containing compound and (2) a mixture of alkylenimine and organoalkoxysilane, wherein:

a. said epoxy group-containing compound is monoepoxide compound which additionally contains ethylenic unsaturation,

b. said organoalkoxysilane is selected from the group consisting of acrylatoalkoxysilane, methacrylatoalkoxysilane and vinylalkoxysilane, and

c. said monomer percentages are based on the weight of monomers used in the copolymerization process,

in the presence of hydrocarbon dispersing liquid which is a solvent for the polymerizable monomers but a non-solvent for the resultant polymer, and polymeric dispersion stabilizer containing at least two segments of which one segment is solvated by said dispersing liquid and a second segment is of different polarity than said first segment and is relatively insoluble in said dispersing liquid, wherein the reaction is carried out at elevated temperature such that the dispersion polymer first forms and then is crosslinked.

4,180,620
PLASTICIZED POLYVINYL BUTYRAL SHEETING WITH A DIVALENT METAL SALT OF NEO DECANOIC ACID ADHESION CONTROL AGENT

Harold K. Inskip, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1978, Ser. No. 874,612

Int. Cl.[2] **B32B** *27/42, 17/10*

U.S. Cl. 428—524 **3 Claims**

1. In plasticized polyvinyl butyral sheeting having incorporated therein an adhesion control agent, the improvement which comprises an adhesion control agent consisting essentially of about from 0.01–0.5 wt. percent, based on plasticized polyvinyl butyral, of a divalent metal salt of neo decanoic acid wherein the metal is selected from the group consisting of magnesium, calcium, zinc and lead.

4,180,621
PRESSURE-SENSITIVE DUPLICATING STENCIL

Michael Maynard, London, and Walter Jones, Harlow, both of England, assignors to Gestetner Limited, London, England

Filed Dec. 3, 1973, Ser. No. 421,263

Claims priority, application United Kingdom, Dec. 4, 1972, 55968/72

Int. Cl.[2] **B32B** *29/00;* **B41N** *1/24;* **B05C** *17/06*

U.S. Cl. 428—535 **9 Claims**

1. In a pressure-sensitive duplicating stencil comprising (1) a sheet of stencil tissue impregnated with a typable stencilisable ink-impervious main plastics coating comprising film-forming material and non-solvent plasticising oil and (2) a backing sheet, the improvement comprising providing, between the impregnated stencil tissue and backing sheet, (3) a typably stencilisable, substantially continuous laminating plastics coating comprising film-forming material and non-solvent plasticising oil the said coating serving to temporarily adhere the impregnated stencil tissue to the backing sheet over substantially the whole of their contacting surfaces, thereby providing a stencil unit in the form of a single sheet.

4,180,622
WEAR RESISTANT COATING FOR THE WORKING FACE OF DISC-SHAPE MACHINE PARTS MADE OF ALUMINUM OR ALUMINUM ALLOYS

Kurt Burkhard, Schaffhausen, and Peter Kunzmann, Flurlingen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 21, 1978, Ser. No. 926,810

Claims priority, application Switzerland, Sep. 7, 1977, 10987/77

Int. Cl.[2] **B22F** *7/00*

U.S. Cl. 428—564 **13 Claims**

1. A thermally applied wear resistant coating for the working faces of disc-shaped machine parts made of aluminum or aluminum alloys, said coating comprising a cermet coating wherein the metallic component thereof contains aluminum.

10. A wear resistant coating according to claim 1 wherein the said coating is penetrated by holes which do not have a disadvantageous effect on the disc-shaped machine parts, and which are spaced at least 6 mm apart, wherein a straight line joining any two holes makes an angle of at least 30° to the radius drawn through one of the holes.

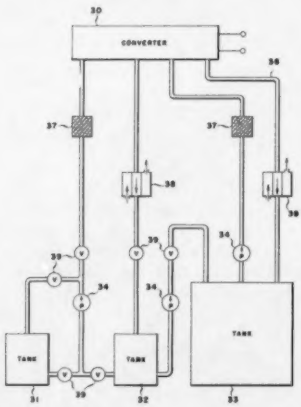
4,180,623
ELECTRICALLY RECHARGEABLE BATTERY

George B. Adams, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 861,535, Dec. 19, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,785

Int. Cl.[2] **H01M** *8/18*

U.S. Cl. 429—21 **11 Claims**



1. An electrically rechargeable battery consisting essentially of at least one inert cathode, at least one zinc anode, a circulating alkaline catholyte in which said cathode is immersed, said catholyte containing a soluble alkali metal ferricyanide salt during electrical charge and a corresponding alkali metal ferrocyanide salt during electrical discharge, and a circulating alkaline anolyte in which said anode is immersed, said catholyte and anolyte permitting, during electrical discharge, electro oxidation of zinc to soluble zincate ions at said anode which are transported by the circulating anolyte to a first storage tank and electro reduction of soluble ferricyanide ions to the corresponding soluble ferrocyanide ions at said cathode which are transported by the circulating catholyte to a second storage tank and, during electrical charge, electrodeposition of zinc

metal on said anode and electro oxidation of soluble ferrocyanide salt to the corresponding ferricyanide salt at said cathode.

4,180,624

STORAGE BATTERY WITH AQUEOUS ELECTROLYTE AND RECOMBINER

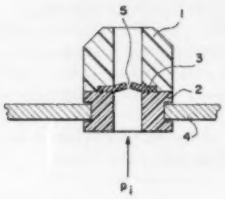
August Winsel, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,098

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804583

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—54 **6 Claims**



1. A storage battery having an aqueous electrolyte and a recombination catalyst for recombining of hydrogen and oxygen evolving during charging or self-discharge, said storage battery comprising

a communicating gas-tight housing for the storage battery and the recombiner, and

two valves in said housing, one of said valves opening in response to a predetermined overpressure relative to the ambient outer atmosphere and the other of said valves opening in response to the falling below a predetermined underpressure.

4,180,625

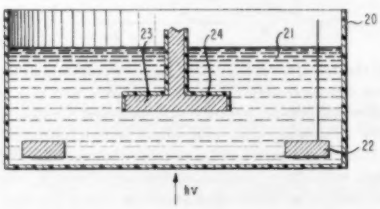
SEMICONDUCTOR LIQUID JUNCTION PHOTOCELL USING A $CuInS_2$ ELECTRODE

Sigurd Wagner, Evergreen, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1978, Ser. No. 935,661

Int. Cl.[2] H01M *6/30, 6/36*

U.S. Cl. 429—111 **5 Claims**



1. A photocell containing a photovoltaic junction between a semiconductor and a liquid electrolyte, said electrolyte containing a redox couple consisting of sulfide and polysulfide anions having a concentration of at least 0.1 molar;

characterized in that

said semiconductor consists essentially of n-type $CuInS_2$.

4,180,626

PROCESS FOR MANUFACTURING CITRIC ACID FROM OLEFINS BY FERMENTATION

Takeo Nagata, Yokohama; Seisuke Satoh, and Takao Matsumoto, both of Tokyo, all of Japan, assignors to Showa Oil Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1977, Ser. No. 865,397

Claims priority, application Japan, Feb. 25, 1977, 52-19285; Feb. 25, 1977, 52-19286

Int. Cl.[2] C12D *1/04*

U.S. Cl. 435—144 **7 Claims**

1. A process for producing citric acid by fermentation which comprises:

culturing olefin assimilable microorganisms comprising *Candida tropicalis* under aerobic conditions at a temperature from about 25° C. to about 40° C. and at a pH from about 3 to about 10 in an aqueous nutrient medium containing olefins, selected from the group consisting of normal olefins having from 8 to 40 carbon atoms and combinations thereof, as the main carbon source together with less than 1,000 g/l of a vitamin selected from the group consisting of biotin or biotin and thiamine-hydrochloric acid.

4,180,627

PROCESS FOR IN VIVO TRANSFER OF CELL-MEDIATED IMMUNITY IN MAMMALS WITH ALCOHOLIC PRECIPITATES OF BOVINE TRANSFER FACTOR

Phillip H. Klesius, Auburn, Ala., and Herman H. Fudenberg, Charleston, S.C., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,289

Int. Cl.[2] C07G *7/00;* A61K *39/00*

U.S. Cl. 435—262 **4 Claims**

1. An improved process for the preparation of a more efficient Bovine Transfer Factor which is useful in immunizing mammals by the transfer of cell-mediated immunity to *Eimeria bovis* antigen, purified protein derivative, and keyhole limpet hemocyanin and other antigens from pathogenic microbes or malignant tissues, the process comprising . . .

(a) grinding a quantity of mesenteric, thoracic, submandibular, cervical, auxillary, prefemoral and popiteal lymphatic nodes from donor cattle,

(b) incubating the material in Hank's salt solution for about 4 hours at 37° C.,

(c) centrifuging the material to separate the desired liquid portion from the solids, which are discarded,

(d) dialyzing the liquid to water for about from 16 to 18 hours at 4° C., to get rid of the unwanted materials, and retain an "unfractionated" Transfer Factor,

(e) lyophilizing the TF to get rid of water,

(f) adding dropwise a quantity of 95% alcohol at 4° C. until a fibrous interphase layer begins to develop,

(g) allowing the interphase development to proceed undisturbed for about 1 hour, then stirring and centrifuging the mixture to separate precipitate Fraction I, which is insoluble in alcohol but soluble in water, from the liquid which is soluble in alcohol,

(h) lyophilizing the precipitate to obtain final Fraction I,

(i) repeating step (f) with the liquid of step (g),

(j) repeating (g) and (h) to obtain precipitate Fraction II, which is soluble in water, and a liquid which is set aside, and

(k) dissolving the precipitate in water and lyophilizing to obtain final precipitate Fraction II.

4,180,628

RESIN FOR SORPTION OF TUNGSTEN

Wayne N. Marchant, and Parkman T. Brooks, both of Salt Lake City, Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 18, 1978, Ser. No. 925,672
Int. Cl.[2] B01J *1/08;* C08G *14/06*
U.S. Cl. 521—39 **6 Claims**

1. A method for preparation of a resin suitable for sorption of tungsten from aqueous solution comprising copolymerizing at a temperature of about 35° to 75° C. (1) 8-hydroxyquinoline, (2) about 0.1 to 0.5 moles of a polyamine from the group consisting of ethylenediamine, diethylenetriamine, triethylenetetramine and tetraethylenepentamine per mole of the 8-hydroxyquinoline, (3) about 0.8 to 1.5 moles of resorcinol per mole of the 8-hydroxyquinoline and (4) about 6 to 9 moles of formaldehyde per mole of the 8-hydroxyquinoline, the polymerization being carried out in aqueous media containing sufficient base to provide a pH of about 12 to 14, for a time sufficient to form a firm gel of the copolymer, and subsequently curing said gel at a temperature of about 80° to 115° C. for a time sufficient to complete the polymerization reaction.

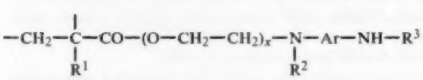
4,180,629

POLYMERS CONTAINING A REACTIVE AROMATIC SYSTEM BASED ON P-PHENYLENEDIAMINE DERIVATIVES

Miroslav Bleha, and Zdeněk Plichta, both of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

Division of Ser. No. 625,317, Oct. 23, 1975, Pat. No. 4,127,732. This application Jun. 29, 1978, Ser. No. 920,236
Claims priority, application Czechoslovakia, Oct. 30, 1974, 7412-74; Oct. 30, 1974, 7413-74; Oct. 30, 1974, 7414-74
Int. Cl.[2] C08F *220/06, 220/56, 226/02*
U.S. Cl. 521—65 **12 Claims**

1. Polymers containing a reactive aromatic system in the side chain which consist of structural units of the general formula IV:



IV,

where

R^1 is hydrogen or CH_3,

R^2 is alkyl containing 1 to 6 carbon atoms,

R^3 is an acyl or sulfonic group,

Ar is a bifunctional aromatic residue, and

x=1 to 4.

4,180,630

PHOSPHORUS-NITROGEN-SILICA COMPOSITION AS A FLAME RETARDANT

Fawzy G. Sherif, Spring Valley, and Mazin R. Irani, Tarrytown, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 748,430, Dec. 8, 1976, Pat. No. 4,137,178. This application Sep. 11, 1978, Ser. No. 941,602
Int. Cl.[2] C08G *22/44, 71/56*
U.S. Cl. 521—106 **6 Claims**

1. A flame retardant, epoxy composition containing an effective amount of an insoluble phosphorus-nitrogen-silica composition consisting essentially of:

30–70 weight % of P_2O_5

1–15 weight % N

15–50 weight % SiO_2

wherein said insoluble composition exhibits X-ray diffraction pattern main identifying peaks as follows:

X-Ray Diffraction Data (Copper K alpha radiation)

2θ	dA°	I/Io
13.13	6.7371	48
13.60	6.5053	58
16.02	5.5276	100
16.90	5.2417	44
21.80	4.0734	32
24.40	3.6449	38
26.18	3.4010	44

4,180,631

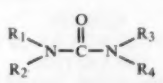
FLAME-AND SMOKE-RESISTANT FLEXIBLE POLYURETHANE FOAM AND COMPRESSED FOAM SHEET

Toshio Yukuta, Kodaira; Takashi Ohashi, Iruma; Minoru Kojima, Ohme, and Masumi Saito, Tanashi, all of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan

Filed Mar. 16, 1977, Ser. No. 778,282
Claims priority, application Japan, Mar. 17, 1976, 51-28948
Int. Cl.[2] C08G *18/32;* B29D *27/00*
U.S. Cl. 521—164 **20 Claims**

1. A flame-and smoke-resistant flexible polyurethane foam obtained by reacting a composition consisting essentially of a polyhydroxyl compound and a polyisocyanate with a urea derivative selected from the group consisting of

a. a compound represented by the general formula



wherein at least one of R_1, R_2, R_3, and R_4 represents hydroxyalkyl-, alkoxyalkyl-, alkyl- and aryl-group and the remainder represents hydrogen atom; and

b. a urea-formaldehyde condensation product prepared by reacting 1 mole of urea with 1 to 4 moles of formaldehyde in the presence of an alkali catalyst, said reacting with a. or b. being in the presence of a catalyst for the production of the polyurethane foam, a surfactant and a blowing agent, wherein the polyisocyanate is used in an amount corresponding to an isocyanate index of 80–130 and the urea derivative is used in an amount of 2–50 parts by weight based on 100 parts by weight of the polyhydroxyl compound.

4,180,632

POLYAMINOESTERS AND FOAMS MADE THEREFROM

Casmir S. Ilenda, Croydon, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 25, 1977, Ser. No. 855,102
Int. Cl.[2] C08J *9/00*
U.S. Cl. 521—184 **18 Claims**

1. Composition comprising solid polyaminoester polymers of one or more esters of acrylic acid monomers having an

average acrylate functionality of at least 2.5 and one or more low molecular weight aliphatic amines having an average amine hydrogen functionality of at least 3 and an amine hydrogen equivalent weight of less than about 100, the equivalents ratio of acrylate to amine hydrogen being about 0.5 to 2.0.

4,180,633

PREPARATION OF INSOLUBLE POLYVINYLPYRROLIDONE

Kenneth W. Dixon, Sewickley, Pa., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 809,943, Jun. 24, 1977, Pat. No. 4,139,688. This application Aug. 23, 1978, Ser. No. 936,019

Int. Cl.[2] C08F *8/18, 8/20*

U.S. Cl. 525—359 **9 Claims**

1. A process for the preparation of insoluble homopolymers or copolymers of vinylpyrrolidone which comprises refluxing uncross-linked polyvinylpyrrolidone or an uncross-linked copolymer of vinylpyrrolidone with an acid chloride selected from the group consisting of phosgene, and oxalyl chloride in a liquid medium at a temperature between about 75° and about 140° C., to obtain a precipitate of cross-linked polyvinylpyrrolidone or of a cross-linked copolymer of vinylpyrrolidone.

4,180,634

POLYMERIZING VINYL CHLORIDE WITH LOWERING OF SCALE FORMATION

Shunichi Koyanagi; Toshihide Shimizu, both of Ibaragi, and Kenji Fushimi, Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 705,021, Jul. 14, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,166

Claims priority, application Japan, Jul. 18, 1975, 50/87975

Int. Cl.[2] C08F *2/18, 18/08, 14/06*

U.S. Cl. 526—62 **9 Claims**

1. A method of polymerizing vinyl chloride or a monomer mixture containing vinyl chloride as a main component, in an aqueous suspension in a polymerization reactor, which comprises adding at least one additive selected from the group consisting of iodine salts of alkali metals and alkaline earth metals to a polymerization mixture in said reactor.

4,180,635

CONTINUOUS MANUFACTURE OF UNSATURATED POLYESTERS

Hermann Fischer, Limburgerhof; Richard Thoma, Battenberg; Hanshelmut Kaeppel, Weinheim; Ernst Kochendoerfer, Ludwigshafen, and Werner Lagaly, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,204

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714898

Int. Cl.[2] C08G *63/52, 63/22*

U.S. Cl. 526—68 **10 Claims**

1. A process for the continuous manufacture of an unsaturated polyester by polycondensation of one or more ethylenically unsaturated dicarboxylic acids, with or without dicarboxylic acid(s) free from olefinic unsaturation, and/or their anhydrides,

with one or more diols, with or without monohydric and/or higher polyhydric alcohol(s), in a stirred kettle cascade, wherein

(a) in a first reaction stage, the dicarboxylic acid or acids and/or its anhydride or their anhydrides are condensed with the alcohol(s) in the molar ratio COOH or $\frac{1}{2}$ (CO)$_2$O:OH of from 1:1.0 to 1:1.1, at from 190° to 250° C., with the proviso that the reaction mixture is boiling, the water of condensation is separated, from the vapors which distil off, by means of a vapor column, and the unconverted distilled-off or sublimed starting materials are recycled to the reaction mixture, the vapor column used being a two-part distillation column

(i) in the upper part of which, at from 95° to 135° C., the diol/water of condensation mixture is separated by spraying it in counter-current with water of condensation, the spray density being from 0.5 to 5 m^3/m^2 per hour and

(ii) in the lower part of the column, at from 110° to 180° C., unconverted dicarboxylic acid(s) and/or anhydride(s) and part of the alcohol are absorbed, partially esterified and washed out by spraying in counter-current, at a spray density of from 20 to 80 m^3/m^2 per hour, with a mixture of refluxing alcohol, freshly fed-in alcohol and circulated reaction medium, and are recycled to the reaction mixture, and

(b) in a second stage of the reaction, the condensation of the resulting reaction mixture is completed at from 190° to 250° C.

4,180,636

PROCESS FOR POLYMERIZING OR CO-POLYMERIZING PROPYLENE

Kiwami Hirota; Hideki Tamano, and Shintaro Inazawa, all of Oita, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,873

Claims priority, application Japan, Jun. 24, 1976, 51-73830; Jun. 28, 1976, 51-75427; Jun. 30, 1976, 51-76533; Jul. 6, 1976, 51-79455; Jul. 27, 1976, 51-88708; Aug. 9, 1976, 51-93948; Aug. 10, 1976, 51-94440

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—125 **30 Claims**

1. A process for polymerizing or copolymerizing propylene in the presence of a catalyst consisting essentially of

(A) a solid catalyst component prepared by contacting

(1) a copulverized material obtained by copulverizing a magnesium dihalide together with an aromatic acyl halide with

(2) a mixture or addition-reaction product of a tetravalent titanium compound containing at least one halogen atom with at least one electron donor compound selected from the group consisting of organic compounds containing a P—O bond, organic compounds containing an Si—O bond, ether compounds, nitrite ester compounds, sulfite ester compounds, alcohol compounds, phenol compounds and naphthol compounds,

(B) a trialkyl aluminum compound, and

(C) an aromatic carboxylic acid ester compound, where the amount of the aromatic acyl halide is 0.01 to 2 moles per mole of the magnesium dihalide, the amount of the titanium compound is 0.1 to 50 moles per mole of the electron donor compound, the amount of the aforesaid mixture or addition-reaction product (as titanium atoms) is 0.001 to 1 mole per mole of the trialkyl aluminum compound and the amount of the aromatic carboxylic acid ester compound is 0.02 to 1 mole per mole of the trialkyl aluminum compound.

4,180,637

PROCESS FOR THE PREPARATION OF LOW MOLECULAR WEIGHT ANHYDRIDE INTERPOLYMERS

Syamalarao Evani, and Russell J. Raymond, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1977, Ser. No. 849,281

Int. Cl.[2] C08F *2/38, 222/02, 222/04, 222/06*

U.S. Cl. 526—204 **16 Claims**

1. In a process for preparing a low molecular weight polymer comprising polymerizing at least one unsaturated dicarboxylic acid anhydride monomer with at least one copolymerizable monomer in an organic solvent in which the monomers and the polymer are soluble and in the presence of a free radical catalyst, the improvement which comprises polymerizing

the monomers in the presence of the hydroxide or a nucleophilic salt of a monovalent cation selected from the group consisting of ammonium, quaternary ammonium cations and alkali metal cations.

4,180,638

STORABLE POLYCHLOROPRENE ADHESIVES AND A PROCESS FOR THEIR PRODUCTION EMPLOYING XANTHOGEN DISULPHIDES

Manfred Dollhausen, Odenthal; Gerhard Hohmann, Leverkusen, and Winfried Behr, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

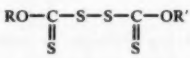
Filed Oct. 28, 1976, Ser. No. 736,308

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2549150

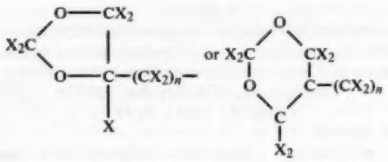
Int. Cl.[2] **C08F** *2/38, 4/40, 136/18;* **C08J** *3/08*

U.S. Cl. 526—204 **8 Claims**

1. A process for producing a storable polychloroprene adhesive which comprises polymerizing 50 to 100 parts by weight of chloroprene monomer and 0 to 50 parts by weight of a monomer copolymerizable with chloroprene in an aqueous, alkaline emulsion in the presence of a radical initiator, an emulsifier containing an alkali metal salt of disproportionated resinic acid and a condensation product of a napthalene sulphonic acid and formaldehyde and a molecular weight regulator at a temperature of from 0° to 70° C., said molecular weight regulator being used in an amount of from 0.1 to 5.0 parts by weight per 100 parts by weight of a total monomer and being a dialkyl xanthogen disulphide of the formula



wherein R and R′ are the same or different and are alkyl having one to four carbon atoms or are



wherein each X is the same or different and is hydrogen, alkyl having one to six carbon atoms, phenyl, napthyl, benzyl, chlorine, bromine or iodine and n is from 1 to 20; discontinuing polymerization when 50 to 90% of total monomer is reacted and dissolving resultant polymer in sufficient organic solvent to obtain a polychloroprene adhesive having a viscosity of from 10 to 100 poises measured at 20° C. with a Brookfield LVT viscosimeter.

4,180,639

FLUOROSULPHONYL OXAFLUOROALKANES, FLUOROSULPHONYL OLEFINES, THEIR COPOLYMERS AND PROCESSES FOR PREPARATION

Gerardo Caporiccio; Gianangelo Bargigia, and Giampiero Guidetti, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

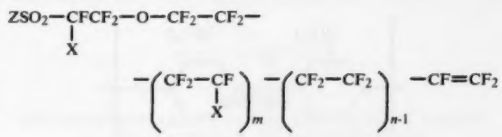
Filed Aug. 3, 1977, Ser. No. 821,394

Claims priority, application Italy, Aug. 6, 1976, 26116 A/76; Mar. 2, 1977, 20831 A/77

Int. Cl.[2] **C07C** *143/16*

U.S. Cl. 526—243 **2 Claims**

1. Fluorinated olefines of the formula:



wherein m is zero or a number between 1 and 2, n is a whole number between 1 and 10, X is F, CF_3 or Cl, Z is F, OH, OM wherein M is a cation or OR wherein R is an alkyl containing from 1 to 8 carbon atoms or an aryl, all having an average molecular weight between 400 and 800.

4,180,640

ACCELERATOR FOR CURABLE ACRYLIC ESTER COMPOSITIONS

David P. Melody; Daniel A. Doherty; John F. O'Grady, all of Dublin, Ireland, and Richard D. Rich, Avon, Conn., assignors to Loctite Corporation, Newington, Conn.

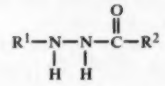
Filed Oct. 31, 1977, Ser. No. 846,871

Claims priority, application Ireland, Nov. 8, 1976, 2477/76

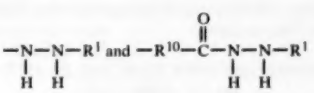
Int. Cl.[2] **B32B** *7/12;* **C08F** *20/20, 20/36;* **C09J** *3/00*

U.S. Cl. 526—323.1 **60 Claims**

1. A curable adhesive and sealant composition comprising: (a) a room temperature polymerizable acrylate ester; (b) a peroxy free radical initiator in an amount sufficient to initiate polymerization of said ester; (c) as a polymerization accelerator, a compound having the formula



wherein R^1 is selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl and R^2 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, alkoxy, aryloxy, carbonyl group connected to an unreactive lower alkyl group of 1 to 4 carbons, amino, and the following groups:



wherein R^{10} is selected from the group consisting of alkyl groups containing one to about 10 carbon atoms, alkenyl groups containing two to about 10 carbon atoms, and aryl groups containing up to about 10 carbon atoms, said accelerator being present in an amount sufficient to accelerate the polymerization at room temperature; and (d) as co-accelerator, an acid having a pK_a at room temperature of about 1 to about 6.

4,180,641

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

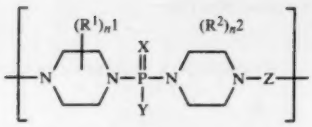
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 26, 1978, Ser. No. 919,106

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] **C08G** *77/26*

U.S. Cl. 528—27 **12 Claims**

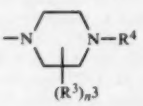
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents OC—R^5—SiR_2^6—

(vi) R^5 and R^6 represent an aliphatic, cycloaliphatic or aromatic hydrocarbon radical, or a heterocyclic radical.

4,180,642

ROOM TEMPERATURE CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Toshio Takago, Annaka, Japan, assignor to Shin-Etsu Chemical Company, Tokyo, Japan

Filed Jun. 21, 1978, Ser. No. 917,660

Claims priority, application Japan, Jun. 29, 1977, 52-77590

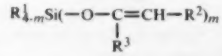
Int. Cl.[2] C08G *77/12*

U.S. Cl. 528—32 **9 Claims**

1. A room temperature curable organopolysiloxane composition which comprises

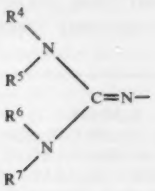
(a) 100 parts by weight of a diorganopolysiloxane terminated at both chain ends with hydroxy groups, represented by the general formula HO—$(R_2Si—O)_nH$ where R is a monovalent hydrocarbon group and n is a positive integer,

(b) from 1 to 25 parts by weight of a vinyloxy-containing silane represented by the general formula



where R^1 is a substituted or unsubstituted monovalent hydrocarbon group, R^2 and R^3 are each a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group and m is 3 or 4, or a partial hydrolysis-condensation product, and

(c) from 0.01 to 10 parts by weight of an organosilane or an organopolysiloxane having in a molecule at least one monovalent group represented by the general formula



(II)

where R^4, R^5, R^6 and R^7 are each a hydrogen atom or a monovalent hydrocarbon group and the group represented by formula II is bonded to the silicon atom by a divalent group.

4,180,643

ACRYLAMIDE OR METHACRYLAMIDE QUATERNARY COMPOUNDS

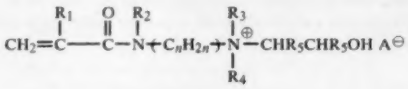
Philip H. Moss, and Edward C. Y. Nieh, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,178

Int. Cl.[2] C07C *103/58*

U.S. Cl. 528—52 **5 Claims**

1. An acrylamide or methacrylamide quaternary characterized by the following structural formula:



where R_1, R_2 and R_5 are hydrogen or methyl, R_3 and R_4 are lower alkyl, n is an integer ranging from 1 to 6 and A represents an anion.

4,180,644

POLYURETHANE CHAIN-EXTENDERS

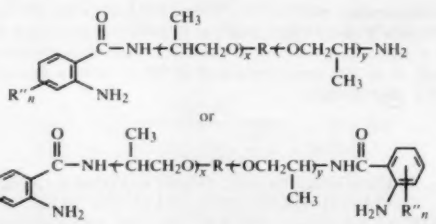
Edward T. Marquis, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,756

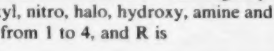
Int. Cl.[2] C08G *18/32*

U.S. Cl. 528—68 **2 Claims**

1. A polyurethane composition prepared by reacting an organic polyisocyanate with a polymeric polyhydroxy compound and a chain-extending agent having the following structural formula:



where R'' is selected from a group consisting of hydrogen, alkyl, nitro, halo, hydroxy, amine and cyano and n is a number of from 1 to 4, and R is



where x and y are numbers from 1 to 10, r, s, and t, are numbers of from 1 to 6 and z is a number of from 4 to 50.

4,180,645

POLYURETHANE COATING COMPOSITIONS FROM DICYCLOPENTENYL ACRYLATE AND/OR METHACRYLATE

William D. Emmons, Huntingdon Valley; Kayson Nyi, Sellersville, and Peter R. Sperry, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 22, 1978, Ser. No. 908,426
Int. Cl.[2] C08G *18/30, 18/22;* C08L *27/00, 75/04*
U.S. Cl. 528—73 12 Claims

1. A composition having a film-forming binder comprising:
(a) a member selected from the group consisting of an organic polyisocyanate, a urethane oil, and a uralkyd;
(b) at least one non-volatile reactive liquid monomer selected from the group consisting of dicyclopentenyl acrylate and dicyclopentenyl methacrylate; and
(c) an effective amount of a polyvalent metalcontaining complex or salt that catalyzes the curing of (a) and (b),
compound (b) being 5 to 95% by weight of the binder.

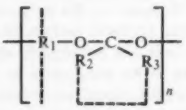
4,180,646

NOVEL ORTHOESTER POLYMERS AND ORTHOCARBONATE POLYMERS

Nam S. Choi, Seoul, Rep. of Korea, and Jorge Heller, Palo Alto, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 544,808, Jan. 28, 1975, Pat. No. 4,093,709.
This application Mar. 3, 1978, Ser. No. 883,123
Int. Cl.[2] C08G *65/28, 65/34*
U.S. Cl. 528—153 55 Claims

1. A polymer of the general formula:



wherein R_1 is the member selected from the group of divalent, trivalent and tetravalent radicals consisting of alkylene of 2 to 10 carbons; alkenylene of 2 to 10 carbons; alkyleneoxy of 2 to 6 carbons; cycloalkylene of 3 to 7 carbons; cycloalkylene of 3 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and and alkenyl of 2 to 7 carbons; cycloalkenylene of 4 to 7 carbons; cycloalkenylene of 4 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; arylene; and arylene substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; R_2 and R_3 are selected from the group consisting of alkyl of 1 to 7 carbons; alkenyl of 2 to 7 carbons; alkoxy of 1 to 7 carbons; alkenyloxy of 2 to 7 carbons; alkylene of 2 to 6 carbons; alkenylene of 3 to 6 carbons; alkyleneoxy of 2 to 6 carbons; alkenyleneoxy of 3 to 6 carbons; arylene; aryloxy and aralkyleneoxy of 8 to 12 carbons intramolecularyl covalently bonded to each other; aralkenyleneoxy of 8 to 12 carbons; aralkylenedioxy of 8 to 12 carbons; aralkenylenedioxy of 8 to 12 carbons; oxa; OR_1O with R_1 as defined above; a heterocyclic ring of 5 to 8 atoms formed when R_2 and R_3 are taken together; a heterocyclic ring of 5 to 8 atoms substituted with an alkyl of 1 to 7 carbons; an alkoxy of 1 to 7 carbons and an alkenyl of 2 to 7 carbons formed when R_2 and R_3 are taken together; a fused polycyclic ring of 8 to 12 atoms formed when R_2 and R_3 are taken together; a fused polycyclic ring of 8 to 12 atoms substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons and an alkenyl of 2 to 7 carbons; and wherein at least one of said member R_2 and R_3 is selected from the group consisting of alkoxy, alkenyloxy and OR_1O, and when R_2 and R_3 are independently alkoxy and alkenyloxy and the other member of said R_2 and R_3 is selected from the group consisting of alkyl, alkenyl, alkoxy, alkenyloxy, alkylene, alkenylene, alkyleneoxy and oxa; and when R_2 and R_3 are taken together, a member selected from the group of heterocyclic and fused polycyclic rings; and n is greater than 10.

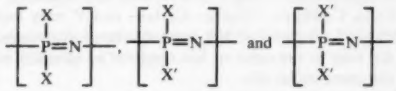
4,180,647

POLYPHOSPHAZENE COPOLYMERS CONTAINING MALONONITRILE AND SUBSTITUTED MALONONITRILE SUBSTITUENTS

William J. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,117
Int. Cl.[2] C08G *79/06*
U.S. Cl. 528—168 10 Claims

1. A polyphosphazene copolymer containing randomly distributed units represented by the formulas:



wherein X is $-CR(CN)_2$ in which R is selected from the group consisting of H, a branched chain, a straight chain, or cyclic alkyl group containing from 1 to 12 carbon atoms and an aryl group or mixtures thereof, and where X′ is selected from the group consisting of substituted and unsubstituted alkoxy, alkenyloxy, aryloxy, alkenylaryloxy, amino and mercapto groups or mixtures thereof.

4,180,648

CRYSTALLINE POLYIMIDES

Terry L. St. Clair, and Anne K. St. Clair, both of Poquoson, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 15, 1978, Ser. No. 906,299
Int. Cl.[2] C08G *73/10*
U.S. Cl. 528—207 4 Claims

1. A crystalline polyimide formed as the reaction product of 4,4′-bis-(3,4-dicarboxyphenoxy)diphenylsulfide dianhydride and p-phenylenediamine.

4,180,649

HOMOPOLYMERIZABLE ACETYLENE-TERMINATED TETRAIMINES AND PROCESS FOR MAKING SAME

Norman Bilow, Encino, and William B. Austin, Gardena, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

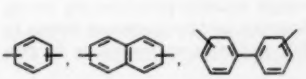
Filed Nov. 20, 1978, Ser. No. 962,575
Int. Cl.[2] C08 *12/08*
U.S. Cl. 528—245 15 Claims

1. A homopolymerizable acetylene substituted tetraimine oligomer having the structure:

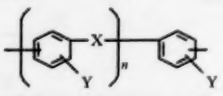
$$HC{\equiv}C{-}Ar{-}N{=}CH{-}Ar'{-}CH{=}N{-}R{-}N{=}CH{-}Ar'{-}CH{=}N{-}Ar{-}C{\equiv}CH$$

where:

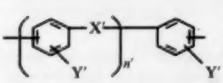
R is a moiety whose structure is selected from the group consisting of



-continued



wherein; n may range from 0 to about 4, X may be O, S, SO_2, CH_2, CF_2, C_3F_6, C_2F_4, —CH=CH—, —CH_2—CH_2— a bond or NH and Y may be —CH_3, —C_2H_5, —C_6H_5, —CF_3 or Cl; Ar is a moiety selected from the group consisting of



wherein n' may range from 0 to 2, X' may be O, S, SO_2, CF_2, C_2F_4, C_3F_6, $C_{10}H_6$ or —C_6H_4—C_6H_4— and Y' may be aryl, alkyl, arylakyl, alkylaryl or halogen substituted analogues; and where Ar' may be the same as, but need not be identical to, Ar within the same molecule.

14. A process for preparing a homopolymerizable acetylene terminated tetraimine oligomer comprising the steps of first reacting aryldicarboxaldehydes with an aryldiamine to form a dicarboxaldehyde terminated diamine and subsequently reacting said dicarboxaldehyde terminated diamine with aminoarylacetylenes thereby forming said acetylene terminated tetraimine.

4,180,650

NITROTHIOPHENE-ACCELERATED LACTAM POLYMERIZATION

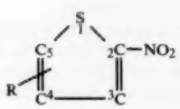
Henry Y. Lew, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 21, 1978, Ser. No. 898,604

Int. Cl.[2] C08G *69/20*

U.S. Cl. 528—313 **25 Claims**

1. A process for polymerizing a lactam to a polylactam, capable of being formed into filaments, films, or other shaped articles, which comprises polymerizing a lactam, selected from the group consisting of 2-pyrrolidone and epsiloncaprolactam, under substantially anhydrous conditions in the presence of an anionic catalyst, a polymerization activator, and a catalytically effective amount of an accelerator selected from the group consisting of nitrothiophene compounds having the formula



wherein R is hydrogen or lower alkyl having 1 through 4 carbon atoms;

and mixtures thereof.

4,180,651

POLYCARBONATE COMPOSITION HAVING RESISTANCE TO HIGH HEAT DISTORTION

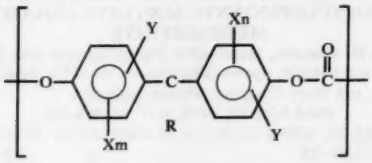
Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 28, 1978, Ser. No. 882,241

Int. Cl.[2] C08G *63/62*

U.S. Cl. 528—202 **11 Claims**

1. A high molecular weight aromatic polycarbonate having resistance to high heat distortion, said polycarbonate having an I.V. of about 0.40–1.0 dl/g. and being represented by the general formula



wherein Xm and Xn can each independently be a halogen and mixtures thereof; m and n are each 0.0 to about 2.5 with the proviso that m+n equal at least 0.1, but no more than about 2.5; Y is a C_1–C_4 alkyl, hydrogen, and mixtures thereof; and R is a C_3–C_9 alkylene.

4,180,652

POLYESTER TYPE POWDER COATING COMPOSITION

Sumitaka Nogami, Fujisawa; Yoshio Matsumoto, Nobeoka; Keiichi Waki, Nobeoka, and Tooru Okada, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

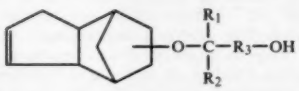
Filed Feb. 16, 1978, Ser. No. 878,445

Claims priority, application Japan, Feb. 24, 1977, 52/18656; Oct. 7, 1977, 52/120124

Int. Cl.[2] C08G *63/76*

U.S. Cl. 525—437 **9 Claims**

1. A polyester type powder coating composition comprising a polyester comprising as main ester-constituting monomer units, (1) at least one polycarboxylic acid component containing at least 10 mole %, based on the polycarboxylic acid component, of at least one aromatic polycarboxylic acid component (A) and (2) at least one polyhydric alcohol component, said polyester having in its main chain at least one terminal blocked with a monofunctional unsaturated alicyclic compound component (B) which is a monohydric alcohol component of a compound represented by the following formula and/or its derivative wherein at least one hydrogen atom of its tricyclodecene ring is substituted with an alkyl group having 1 to 3 carbon atoms or halogen:



wherein R_1 and R_2 each stand for a hydrogen atom or an alkyl group having 1 to 3 carbon atoms and R_3 stands for a straight-chain or branched alkylene group having 1 to 10 carbon atoms or a divalent residue having at least one member selected from an ether linkage, an ester linkage, an urethane linkage, amide linkage, thioether linkage and sulfone linkage, and a straight-chain or branched alkylene group having 1 to 10 carbon atoms and/or phenylene group, and the total of the carbon atoms of R_1, R_2 and R_3 is 0 to 19, and said polyester having a softening point of 30° to 150° C.

4,180,653

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

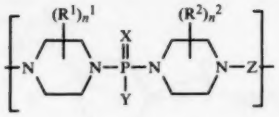
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 23, 1978, Ser. No. 918,247

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G *75/18, 75/20*

U.S. Cl. 528—391 **11 Claims**

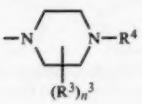
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group an N-containing heterocyclic group, acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents

or

and

(vi) R^5 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or a heterocyclic radical.

4,180,654

4″-DEOXY-4″-ACYLAMIDO DERIVATIVES OF OLEANDOMYCIN, ERYTHROMYCIN AND ERYTHROMYCIN CARBONATE

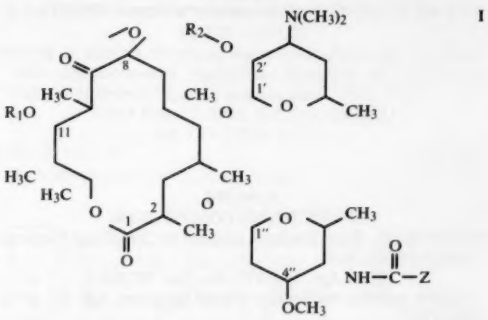
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 866,722, Jan. 3, 1978, abandoned. This application Aug. 29, 1978, Ser. No. 937,640

Int. Cl.[2] C07H *17/08*

U.S. Cl. 536—9 **41 Claims**

1. A compound having the formula

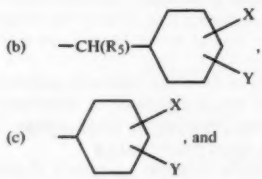


I

wherein each of R_1 and R_2 is selected from the group consisting of hydrogen and alkanoyl having from two to three carbon atoms;

Z is selected from the group consisting of

(a) —$(CH_2)_m$—$C(CH_3)_3$,



(b) ,

(c) , and

(d) —$(CH_2)_m$-heterocyclyl;

m is 0 or 1;

R_5 is selected from the group consisting of hydrogen, chloro, hydroxy, methyl, amino and alkoxy having from one to four carbon atoms;

X is selected from the group consisting of hydrogen, chloro, bromo, fluoro, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms;

Y is selected from the group consisting of X, trifluoromethyl and carbalkoxy having from two to five carbon atoms;

heterocyclyl is selected from the group consisting of thienyl, pyrazinyl, pyridyl, furyl, imidazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrrolyl, thiadiazolyl and monomethyl derivatives of said heterocyclyls;

and the pharmaceutically acceptable acid addition salts thereof.

4,180,655

NITROSOUREA DERIVATIVES

Tetsuo Suami, 5-8, 3-chome, Nakamachi, Musashino-shi, Tokyo, Japan; Tomoya Machinami, Shiraoka, and Takashi Hisamatsu, Yokohama, both of Japan, assignors to Tetsuo Suami, Musashino, Japan

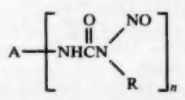
Division of Ser. No. 600,206, Jul. 30, 1975, Pat. No. 4,086,415. This application Jan. 20, 1978, Ser. No. 870,884

Claims priority, application Japan, Aug. 8, 1974, 49-90266

Int. Cl.[2] C07H *15/20*

U.S. Cl. 536—17 R **5 Claims**

1. Nitrosourea of the formula:



wherein A represents a hydroxy-substituted cyclohexyl when n=1 or A represents a tetravalent residue of ribostamycin

from which the four amino groups have been removed when n=4 and R represents a halo-substituted lower alkyl.

4,180,656

AZOMETHINE COMPOUNDS

Robert Garner, Bury, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

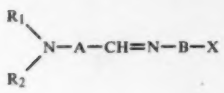
Filed Apr. 15, 1977, Ser. No. 787,806

Claims priority, application United Kingdom, Apr. 27, 1976, 17023/76

Int. Cl.[2] C07C *119/00*

U.S. Cl. 542—423 **4 Claims**

1. An azomethine compound of the general formula

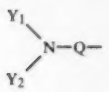


(1)

wherein

A and B, independently of the other, represent naphthylene or phenylene which are unsubstituted or substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, benzyloxy or phenoxy,

X represents a group of the formula



(1a)

R_1 and Y_1 each represents alkyl of at most 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano, lower alkoxy or lower alkyl-carbonyloxy; cycloalkyl, phenyl, benzyl or phenyl or benzyl which are substituted by halogen, nitro, lower alkyl or lower alkoxy, R_2 and Y_2 each represents hydrogen, alkyl of at most 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano, lower alkoxy or lower alkyl-carbonyloxy; cycloalkyl, benzyl or benzyl which is substituted by halogen, nitro, lower alkyl or lower alkoxy or each pair of substituents R_1 and R_2 or Y_1 and Y_2, together with the nitrogen atom to which they are attached, independently represents a 5- or 6- membered heterocyclic radical, and Q represents $-SO_2-$.

4,180,657

ACYL-SUBSTITUTED PHENYL ESTERS OF PROSTACYCLIN-TYPE COMPOUNDS

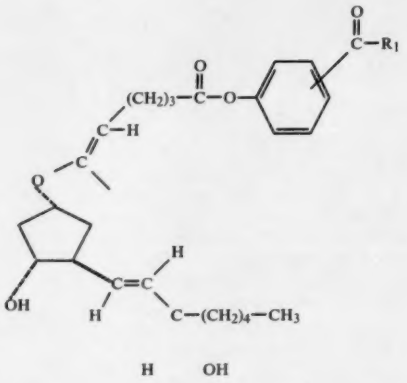
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 14, 1978, Ser. No. 933,329

Int. Cl.[2] C07D *307/93, 311/94*

U.S. Cl. 542—426 **63 Claims**

1. An acid ester of prostacyclin of the formula

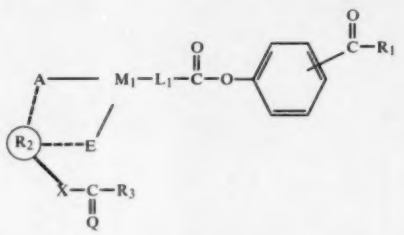


H OH

or its (5E) isomer, wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the group

is only in the 4-position.

12. An acid ester of a prostacyclin analog of the formula



wherein A is (1) —O—(oxa) or, when E is $-CH_2-$, (2) $-CH_2-O-$, with $-CH_2$ bonded to (R)

wherein E is $-CH_2-$ or $-CH_2CH_2-$,

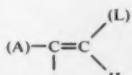
wherein L_1 is

(1) $-(CH_2)_n-$ wherein n is one to 5, inclusive,

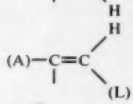
(2) $-(CH_2)_p-CF_2-$ wherein p is 2, 3, or 4, or

(3) $-(CH_2)_v-CH=CH-$ wherein v is 1, 2, or 3,

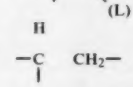
wherein M_1 is



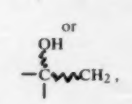
(1)



(2)



(3)

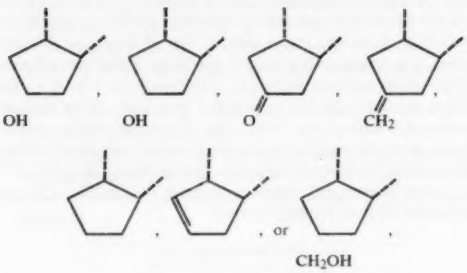


or

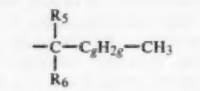
(4)

where ~ indicates attachment in alpha or beta configuration,
wherein Q is

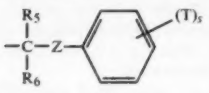
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the —C(O)—R_1 group is in the 4-position,
wherein R_2 is



wherein R_3 is

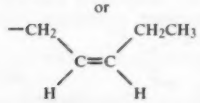


(1)



(2)

or



(3)

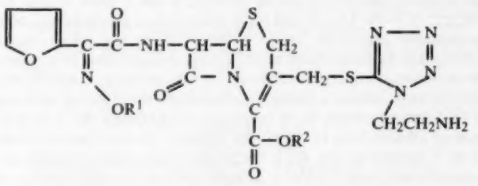
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);
wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring;
wherein T is alkyl of one to 4 carbon atoms; inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other thn alkyl and when s is 2 or 3 the T's are either the same or different, and
wherein X is
(1) trans-CH=CH—
(2) cis-CH=CH—
(3)—C≡C— or
(4) —CH_2CH_2—
with the proviso that said formula does not include prostacyclin or its (5E) isomer.

4,180,658
7[-2-ALKOXYAMINO(ACETAMIDO)]CEPHALOSPORIN DERIVATIVES

Murray A. Kaplan, Syracuse; Alphonse P. Granatek, Baldwinsville, and Solomon J. Nachfolger, Syracuse, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 880,836
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—27 **8 Claims**

1. A compound having the formula



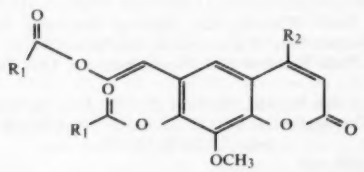
wherein R^1 is alkyl of 1–4 carbon atoms and R^2 is hydrogen or a conventional, pharmaceutically acceptable, easily hydrolyzed ester forming group; or a nontoxic, pharmaceutically acceptable salt thereof, said compound being at least 75% by weight in the form of its syn isomer.

4,180,659
COUMARIN DERIVATIVES TO PRODUCE 8-METHOXYPSORALEN

Pasquale N. Confalone; Elizabeth D. Lollar, both of Bloomfield; Giacomo Pizzolato, Belleville, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 823,257, Aug. 10, 1977, Pat. No. 4,130,568, which is a continuation-in-part of Ser. No. 723,116, Sep. 14, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,131
Int. Cl.[2] C07D *311/16, 405/12*
U.S. Cl. 542—427 **3 Claims**

1. A compound of the formula



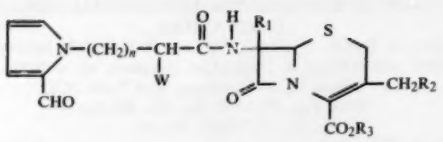
wherein R_2 is selected from the group consiting of hydrogen, lower alkyl, phenyl, pyridyl, furyl, halo or lower alkyl substituted phenyl, benzyl and alkoxy, halo, nitro or lower alkyl substituted benzyl and R_1 is selected from the group consisting of lower alkyl, phenyl, pyridyl, furyl, halo or lower alkyl substituted phenyl, benzyl and alkoxy, halo, nitro or lower alkyl substituted benzyl.

4,180,660
CEPHALOSPORIN DERIVATIVES

Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness Ziona, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 839,165, Oct. 4, 1977, Pat. No. 4,122,260. This application Sep. 1, 1978, Ser. No. 938,844
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—28 **12 Claims**

1. A compound selected from the base of the formula



wherein n is 0, 1, 2 or 3; W is hydrogen, a straight or branched alkyl group of from 1 to 4 carbon atoms, a sulfonic acid group, or a—$(CH_2)_p$—CO_2R_4 group wherein p has a value of 0 or an integer of from 1 to 10 and R_4 is hydrogen, a pharmaceutically acceptable non-toxic cation selected from the alkali metal group, the alkaline earth metal group, ammonium, or organic ammonium compounds derived from a primary, a secondary or a tertiary amine, a straight or branched alkyl group of from 1 to 4 carbon atoms; R_1 is hydrogen or methoxy; R_2 is hydrogen or alkanoyloxy in which the alkanoyl group contains from 2 to 5 carbon atoms; R_3 is hydrogen, a pharmaceutically acceptable non-toxic cation; a straight or branched alkyl group of from 1 to 4 carbon atoms, an alkanoyloxymethyl group in which the alkanoyl portion is straight or branched and has from 2 to 5 carbon atoms, an alkanoylaminomethyl group in which the alkanoyl portion is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen may be substituted with a straight or branched alkyl group having 1 to 4 carbon atoms, an alkoxycarbonylaminomethyl group in which the alkoxy portion is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with a straight or branched alkyl group of from 1 to 4 carbon atoms, p-(alkanoyloxy)benzyl groups in which the alkanoyl portion is straight or branched and has from 2 to 5 carbon atoms, an aminoalkanoyloxymethyl group in which the alkanoyl portion has from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a straight or branched alkyl group having from 1 to 4 carbon atoms; with the proviso that when R_3 is other than hydrogen or a cation and W is —$(CH_2)_p$—CO_2R_4 with p being from 1 to 10, then R_4 is other than hydrogen or a cation; and pharmaceutically acceptable salts thereof.

4,180,661

7-[(SUBSTITUTED-ISOTHIOUREAMETHYL)PHENYL]-ACETAMIDOCEPHALOSPORIN DERIVATIVES

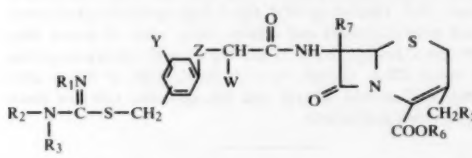
Fortuna Haviv, Wheeling, Ill.; Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness-Ziyona, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 854,668, Nov. 25, 1977, Pat. No. 4,125,715. This application Jul. 17, 1978, Ser. No. 925,099

Int. Cl.[2] **C07D** *501/20*

U.S. Cl. 544—29 **5 Claims**

1. A compound of the formula



wherein Y is selected from the group consisting of hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, or an alkoxy group of from 1 to 4 carbon atoms; Z is a bond, oxygen or sulfur; W is selected from the group consisting of hydrogen, methyl, amino, hydroxy, —SO_3H or $COOR_4$ wherein R_4 is hydrogen or 5-indanyl with the proviso that when Z is oxygen or sulfur, W is other than hydroxy; R_7 is selected from the group consisting of hydrogen or methoxy; each of R_1, R_2, R_3 is selected from the group consisting of hydrogen, amino, formylamino, guanylamino, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, wherein R_1 and R_2 are a concatenated chain of methylene groups having from 3 to 6 methylenes, with the proviso that when R_1 and R_2 are hydrogen or lower alkyl, R_3 is amino, formylamino or guanylamino; R_5 is hydrogen or acetoxy; R_6 is selected from the group consisting of hydrogen, a cation of an alkali metal or an alkaline earth metal, ammonium, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, an alkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, an alkanoylaminomethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen may be substituted with hydrogen or a straight or branched lower alkyl group having 1 to 4 carbon atoms, an alkoxycarbonylaminomethyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a p-(alkanoyloxy)benzyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms, an aminoalkanoyloxymethyl group in which the aminoalkanoyl moiety has from 2 to 15 carbon atoms and the amino nitrogen may be hydrogen or mono- or di-substituted with a straight or branched lower alkyl group having from 1 to 4 carbon atoms; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,180,662

THIAZINE DERIVATIVES

Rudolf Pfister, Basel; Paul Zeller, Allschwil, both of Switzerland; Dieter Binder, and Otto Hromatka, both of Vienna, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

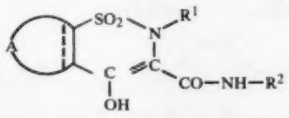
Filed Aug. 31, 1978, Ser. No. 938,274

Claims priority, application Luxembourg, Sep. 6, 1977, 78083; Switzerland, Jul. 21, 1978, 7908/78

Int. Cl.[2] **C07D** *513/04*

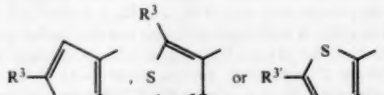
U.S. Cl. 544—48 **17 Claims**

1. A compound of the formula



I

wherein A together with the two carbon atoms forms the group



and the dotted line indicates the double bond present in the first and last thieno structures above, R^1 is lower alkyl, R^2 is selected from the group consisting of 2-thiazolyl, 4-methyl-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 5-methyl-1,3,4-thiadiazolyl, 2-pyrazinyl, 2-pyrimidinyl, 1,2,4-triazine-3-yl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6-dimethyl-2-pyridyl, 5-isoxazolyl, 5-methyl-3-isoxazolyl, 3,4-dimethyl-5-isoxazolyl, 2,6-dimethyl-4-pyrimidinyl, 1,2,3,4-tetrazol-5-yl or a phenyl radical optionally substituted by halogen, hydroxy, lower alkyl, trifluoromethyl or lower alkoxy, R^3 is halogen and $R^{3'}$ is hydrogen or halogen,

or a pharmaceutically acceptable salt thereof.

4,180,663
METHINE DYE SYNTHESIS

Mark D. Frishberg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 820,959, Aug. 1, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,677

Int. Cl.[2] **C07C** *121/22;* **C07D** *215/12, 265/34*

U.S. Cl. 544—105 **8 Claims**

1. Process for the preparation of a disperse methine dye containing at least one dicyanomethylidene group comprising the steps of

(A) preparing an anhydrous solution of an aldehyde formed by contacting an aromatic amine, 1,2,3,4-tetrahydroquinoline or benzomorpholine compound capable of undergoing the Vilsmeier-Haack reaction with $POCl_3$ and a dialkylformamide wherein the alkyl moiety is 1–4 carbon atoms;

(B) subsequently adding to said solution at about 15° C. to about 40° C., at least one equivalent of cyanoacetamide based on the equivalents of aldehyde formed in (A), thereby forming a reaction mixture of aldehyde and in situ generated malonitrile; and

(C) adjusting the pH of the solution to a point sufficient for the condensation of the aldehyde and in situ generated malononitrile to occur thereby producing a disperse methine dye.

4,180,664
PROCESS FOR IMPROVING THE COLOR YIELD AND FASTNESS PROPERTIES OF DYEINGS PRODUCED WITH ANIONIC DYES ON CELLULOSE FIBRE MATERIAL AND CATIONIC FIBRE-REACTIVE COMPOUNDS

Pierre Perrin, Basel; Gert Hegar, Schönenbuch; Gérald Siegrist; Herbert Seiler, both of Riehen, and Ulrich Horn, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

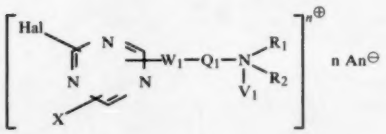
Filed Jun. 9, 1977, Ser. No. 805,208

Claims priority, application Switzerland, Jun. 16, 1976, 7674/76

Int. Cl.[2] **C07D** *251/50, 251/42, 251/22*

U.S. Cl. 544—194 **15 Claims**

1. A cationic compound of the formula

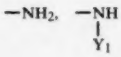


(1)

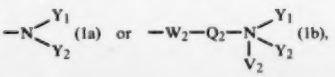
wherein

Hal is a reactive halogen atom,

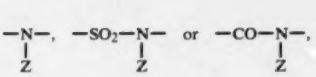
x is halogen, lower alkoxy, lower alkylthio, phenoxy, phenylthio,



or the group of the formula



each of W_1 and W_2 independently are the direct bond,



Z is hydrogen, lower alkyl or hydroxy-lower alkyl,

each of Q_1 and Q_2 independently are an aliphatic or cycloaliphatic radical, selected from the group consisting of alkylene of 2 to 4 carbon atoms and cyclohexylene,

each of R_1, R_2, V_1, V_2, Y_1 and Y_2 independently are lower alkyl or benzyl or lower alkyl or benzyl each of which is substituted by halogen, hydroxyl or cyano,

$An^{\ominus}$ is the anion of an organic or inorganic acid, and n is 1 or 2.

4,180,665
SUBSTITUTED 3-BENZ(CD)INDOL-2-(1H)-YLIDENE-FURO[2,3-b]QUINOXALIN-2(3H)ONE DYESTUFFS

Hansrudolf Schwander, Riehen, and Christian Zickendraht, Binningen, both of Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

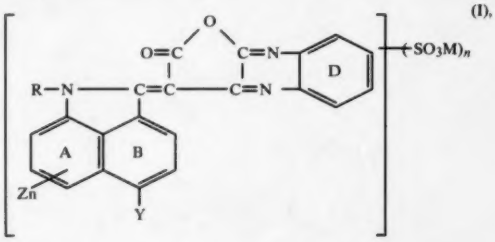
Filed May 13, 1977, Ser. No. 796,588

Claims priority, application Switzerland, Jun. 1, 1976, 6861/76

Int. Cl.[2] **C09B** *17/00, 57/00;* **D06P** *3/24, 3/52*

U.S. Cl. 544—345 **11 Claims**

1. A dyestuff of the formula (I)



(I),

in which R represents C_1–C_5-alkyl, C_1–C_5-alkenyl, C_5–C_6-cycloalkyl, C_6–C_9-aralkyl, C_6–C_9-aryl or hydrogen, M represents hydrogen or a cation, Y represents —COOH, —CN, —COCl, $—CONR_1R_2$ or $—COOR_2$ wherein R_1 and R_2 are independently C_1–C_{18} alkyl which is unsubstituted or substituted by C_1–C_4-alkoxy, hydroxy, chloro, bromo, cyano, carboxy C_1–C_4-alkoxy carbonyl, sulfo, carboxamido or acetoxy; cyclopentyl, methyl cyclohexyl, trimethylcyclohexyl or cyclohexyl; or phenyl, benzyl or phenethyl, which are unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halo; and R_1 also represents hydrogen, Z is C_1–C_4-alkoxy, Cl, Br, NO_2, C_1–C_4-alkyl-S-, cyano, $CONH_2$, and n represents 0, 1 or 2 and ring D is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halo, cyano, carbo-C_1–C_4-alkoxy, cyclohexyl, phenyl-C_1–C_3-alkyl, phenyl, ethoxyethoxy or acetyloxyethoxy and if n represents O, D is also substituted by C_1–C_4-alkylsulphonyl, phenylsulphonyl and sulphonamido which is unsubstituted or substituted by 1 or 2 C_1–C_4-alkyl groups.

4,180,666
3,9-DIHYDRO-3,9-DIOXO-2H-INDENO(2,1-C)-PYRIDINE-4-(CARBONITRILES/CARBOXAMIDES)

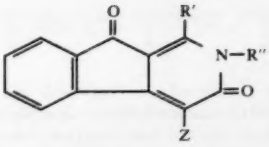
Robert J. Chorvat, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 26, 1978, Ser. No. 973,518

Int. Cl.[2] **C07D** *221/04*

U.S. Cl. 546—111 **12 Claims**

1. A compound of the formula



wherein R′ represents hydrogen, alkyl containing fewer than 4 carbons, or phenyl; R″ represents hydrogen or alkyl containing fewer than 4 carbons; and Z represents cyano or carbamoyl.

4,180,667

2-AZABICYCLO[2.2.2]OCT-5-ENES

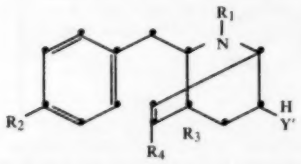
William F. Michne, Poestenkill, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 741,227, Nov. 12, 1976, Pat. No. 4,100,164, which is a continuation-in-part of Ser. No. 695,977, Jun. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 576,313, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 471,571, May 20, 1974, Pat. No. 3,932,422. This application Feb. 13, 1978, Ser. No. 877,166

Int. Cl.[2] C07D *221/22*

U.S. Cl. 546—112 **24 Claims**

1. A compound having the formula



where R_1 is hydrogen, lower-alkyl, cycloalkyl-lower-alkyl containing from three to seven ring carbon atoms, 2-or 3-furylmethyl, or such 2- or 3-furylmethyl substituted on the unsubstituted ring carbon atoms by from one to three methyl groups, or phenyl-lower-alkyl; R_2 is hydrogen, hydroxy or lower-alkoxy; R_3 is hydrogen or lower-alkyl; R_4 is lower-alkyl, lower-alkoxy-lower-alkyl or halo-lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $-(CH_2)_n-$, where n is one of the integers 3 or 4; and Y′ is carboxy, cyano, carbo-lower-alkoxy or lower-alkanoyl, or an acid addition salt thereof.

4,180,668

PIPERIDINO-4H-S-TRIAZOLO[4,3-a][1,4]BENZODIAZEPINES

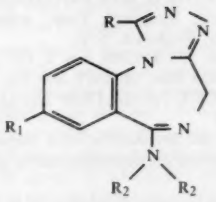
Jackson B. Hester, Jr., Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 8, 1977, Ser. No. 804,627

Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—244.4 **2 Claims**

1. A compound of the formula



wherein R is C_1 to C_3-alkyl, R_1 is a halogen having an atomic number of from 9 to 35, and the two R_2 groups are taken together with the nitrogen to which they are bonded to complete a piperidino group, or a pharmacologically acceptable salt thereof.

4,180,669

2-(N-PHENETHYL-4-PIPERIDINO)-5-PENTYL RESORCINOL

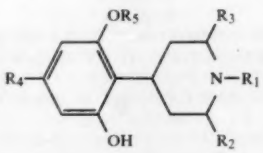
Martin Winn, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 749,634, Dec. 13, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,154

Int. Cl.[2] C07D *211/22*

U.S. Cl. 546—240 **1 Claim**

1. A compound of the formula



wherein R_1 is phenethyl; each of R_2, R_3 and R_5 is H; R_4 is n-pentyl.

4,180,670

AMINO PYRIDINE DERIVATIVES

Edwin T. Edington, Maidenhead, and Alan C. White, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

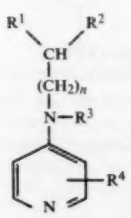
Filed Jan. 30, 1978, Ser. No. 873,192

Claims priority, application United Kingdom, Feb. 2, 1977, 4354/77; Jul. 9, 1977, 28879/77

Int. Cl.[2] C07D *213/38*

U.S. Cl. 546—284 **9 Claims**

1. A compound selected from those having the formula



and their pharmaceutically acceptable acid addition salts, wherein one of R^1 and R^2 is selected from phenyl; naphthyl; phenyl substituted by one or two substituents selected from halogen, lower alkyl, lower alkoxy, lower alkylenedioxy and trifluoromethyl; thienyl; and pyridyl and the other one of R^1 and R^2 is selected from phenyl; naphthyl; phenyl substituted by one or two substituents selected from halogen, lower alkyl,

lower alkoxy, lower alkylenedioxy, trifluoromethyl; thienyl; and pyridyl R^3 and R^4 are independently selected from hydrogen and lower alkyl and n is selected from 0 and 1.

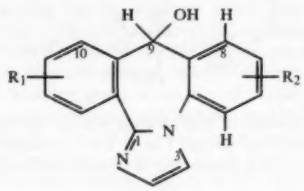
4,180,671

DIBENZ[c,f]IMIDAZO [1.2-a] [1]AZEPIN-9-OLS

William J. Houlihan, Mt. Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed May 22, 1978, Ser. No. 907,951
Int. Cl.[2] C07D *487/04*
U.S. Cl. 548—324 **6 Claims**

1. A compound of the formula



(I)

where

R_1 represents H, mono or dichloro, or mono or difluoro,

R_2 represents H, chloro, fluoro, alkyl of 1–3 carbon atoms, alkoxy of 1–3 carbon atoms or trifluoromethyl.

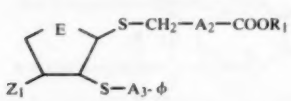
4,180,672

2-ORGANOTHIO-2-CYCLOPENTENONES, ORGANOTHIO-CYCLOPENTANES DERIVED THEREFROM

Seizi Kurozumi; Takeshi Toru; Makiko Kobayashi, all of Hino, and Yoshinobu Hashimoto, Fuzisawa, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 7, 1977, Ser. No. 775,119
Claims priority, application Japan, Aug. 13, 1976, 51-96107; Aug. 13, 1976, 51-96108; Aug. 13, 1976, 51-96109; Nov. 19, 1976, 51-138380; Dec. 1, 1976, 51-143294
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—15 **3 Claims**

1. Organodithiocyclopentanes having the formula



wherein A_1, E, A_2 and R_1 are as defined above, A_3 represents a saturated divalent aliphatic hydrocarbon group containing 1 to 5 carbon atoms which may contain, as a substituent, a hydroxyl group or a protected hydroxyl group; and ϕ represents a phenyl group, cyclohexyl group or cyclopentyl group, which groups may optionally contain one or two trifluoromethyl groups, an hydroxyl group or a halogen atom, or a group of the formula

$$-A_1\text{-}(\text{-}COOR_1)_n$$

wherein R_1 is as defined above, A_1 represents a divalent saturated or unsaturated aliphatic hydrocarbon group containing 1 to 3 carbon atoms; and, n is 0 to 1, and when n is 0, $\text{-}(\text{-}COOR_1)_n$ represents a hydrogen atom.

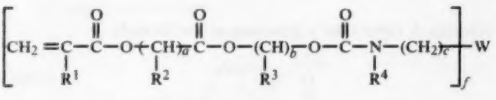
4,180,673

ELECTRON BEAM SENSITIVE MONOMER

Mario D. Burguette, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 10, 1976, Ser. No. 685,118
Int. Cl.[2] C07C *101/44*
U.S. Cl. 560—26 **4 Claims**

1. A monomer polymerizable under the influence of electron-beam represented by the structure



wherein a = 1 or 2, b = 2 to 4, c = 0 or 1, f = 2 or 3;

W is divalent or trivalent aliphatic, cycloaliphatic or aromatic hydrocarbyl group of 6–13 carbon atoms;

R^1 is H, CH_3 or Cl;

Each R^2 and each R^3 is independently H or alkyl of 1 to 4 carbon atoms pendent from an alkylene group, the sum of the carbon atoms in the pendent alkyl groups on one alkylene group being no greater than 4 and

Each R^4 is independently H or alkyl of 1 to 4 carbon atoms.

4,180,674

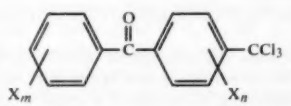
PROCESS FOR PREPARING BUTYL-P-BENZOYLBENZOATES

James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 18, 1977, Ser. No. 816,772
Int. Cl.[2] C07C *69/78*
U.S. Cl. 560—52 **5 Claims**

1. A one step process for preparing butyl-p-benzoylbenzoates comprising:

reacting a 4-(trichloromethyl) benzophenone having the formula:



where each X is an independently selected halogen and m and n are independently selected integers from 0 to 3, with a butanol selected from the group consisting of n-butanol and iso-butanol in the presence of a catalytic amount of a strong mineral acid.

4,180,675

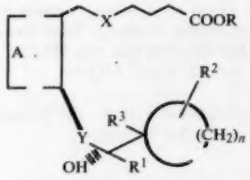
15-CYCLOALKYL-PROSTAGLANDIN DERIVATIVES

Masaki Hayashi; Seiji Kori, both of Takatsuki; Isao Ohyama, Osaka; Sadahiko Iguchi, Tsuzuki, and Takanori Okada, Osaka, all of Japan, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 703,158, Jul. 7, 1976, Pat. No. 4,087,620. This application Dec. 5, 1977, Ser. No. 857,341
Claims priority, application United Kingdom, Jul. 17, 1975, 30072/75; May 6, 1976, 18651/76
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—118 **13 Claims**

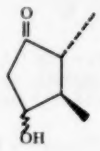
1. Prostaglandin analogues of the formula:

VII



wherein A represents a grouping of the formula:

VIIIB,



X represents ethylene, Y represents ethylene or trans-vinylene, R represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R^1 represents a hydrogen atom or a methyl or ethyl group, R^2 represents a straight- or branched-chain alkyl group containing from 2 to 8 carbon atoms, R^3 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 3 carbon atoms, and n represents 4 or 5, and cyclodextrin clathrates of such acids and esters and, when R represents a hydrogen atom, non-toxic salts thereof.

4,180,676

CONVERSION OF CONJUGATED DIOLEFINS TO DIACYLOXY OLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Ohio

Filed Aug. 25, 1977, Ser. No. 827,631
Int. Cl.[2] C07C 67/05
U.S. Cl. 560—246 **25 Claims**

1. A process for the production of diacyloxy olefins which comprises:

reacting at least one conjugated diolefin with molecular oxygen and an acidic reactant media employing a catalyst system consisting essentially of a uranium compound, an alkali metal-containing compound, and a halide-containing compound, optionally further a dihalobutene adjuvant, thereby preparing said diacyloxy olefin,

wherein said uranium compound is selected from the group consisting of uranium oxides, halides, carboxylates, nitrates, complex uranyl ions, and mixtures;

said alkali metal-containing compound is selected from the group consisting of lithium, sodium, potassium, cesium, and mixtures, of the halides, nitrates, carboxylates, oxides, hydroxides, and mixtures;

and said halide-containing compound is selected from the group consisting of uranium halides, alkali metal halides, alkaline earth metal halides, or mixtures;

wherein said halide is selected from the group consisting of chloride, bromide, iodide, and mixtures;

wherein said acidic reactant media is at least one mono- or dicarboxylic aliphatic, cycloaliphatic, or arylaromatic acid or admixture thereof with an alkyl, cycloalkyl, or arylmono- or dicarboxylic acid anhydride, and

wherein said conjugated diolefin is acyclic or cyclic and can be substituted with halogen, cyano, —COOR′, or hydrocarbyl radicals, wherein R′ is hydrogen or an alkyl radical.

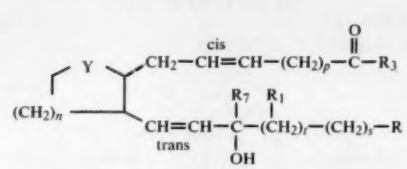
4,180,677

NOVEL PROSTAGLANDINS

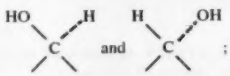
Robert E. Schaub, Upper Saddle River, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 719,650, Sep. 1, 1976, abandoned, which is a division of Ser. No. 555,219, Mar. 4, 1975, Pat. No. 3,993,674, which is a division of Ser. No. 353,152, Apr. 20, 1973, Pat. No. 3,884,969. This application Oct. 28, 1977, Ser. No. 846,487
Int. Cl.[2] C07C 177/00
U.S. Cl. 562—500 **47 Claims**

1. An optically active compound of the formula:

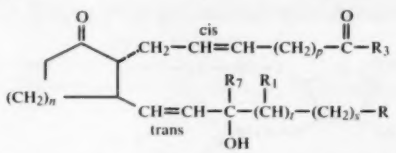


or a racemic compound of that formula and the mirror image thereof wherein n is the integer 1 or 2; Y is a divalent radical selected from the group consisting of those of the formulae:



p is an integer from 2 to 6, inclusive; R_1 is an alkyl group having up to 3 carbon atoms; R_3 is selected from the group consisting of hydroxy and alkoxy having from one to twelve carbon atoms; R_7 is selected from the group consisting of hydrogen and a lower alkyl group having up to 3 carbon atoms; s is zero or an integer from one to five inclusive; t is zero or one; and R is selected from the group consisting of cycloalkyl having from three to nine carbon atoms, cycloalkenyl having from five to nine carbon atoms, mono- or di-lower alkyl substituted cycloalkyl having from three to eight carbon atoms in the ring, and mono- or di-lower alkyl substituted cycloalkenyl having from five to eight carbon atoms in the ring; with the proviso that only one double bond or cyclopropyl group can be immediately adjacent to C_{15}; and the pharmaceutically acceptable cationic salts thereof when R_3 is hydroxy.

38. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof wherein n is the integer 1 or 2; p is an integer from 2 to 6 inclusive, R_1 is an alkyl group having up to 3 carbon atoms; R_3 is selected from the group consisting of hydroxy and alkoxy having from one to twelve carbon atoms; R_7 is selected from the group consisting of hydrogen and a lower alkyl group having up to 3 carbon atoms; s is zero or an integer from one to five inclusive; t is zero or one; and R is selected from the group consisting of cycloalkyl having from three to nine carbon atoms, cycloalkenyl having from five to nine carbon atoms, mono- or di-lower alkyl substituted cycloalkyl having from three to eight carbon atoms in the ring, and mono- or di-lower alkyl substituted cycloalkenyl having from five to eight carbon atoms in the ring; with the proviso that only one double bond or cyclopropyl group can be immediately adja-

cent to C_{15}; and the pharmaceutically acceptable cationic salts thereof when R_3 is hydroxy.

4,180,678

PROCESS FOR PREPARING METHACRYLIC ACID

Masahiro Wada; Michio Ueshima, both of Nishinomiya; Isao Yanagisawa, Ikeda, and Michikazu Ninomiya, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Dec. 27, 1974, Ser. No. 536,864
Claims priority, application Japan, Dec. 29, 1973, 483630
Int. Cl.[2] C07C *51/32, 57/04*
U.S. Cl. 562—534 **8 Claims**

1. A process for preparing methacrylic acid which comprises carrying out the catalytic vapor phase oxidation of methacrolein with a molecular oxygen-containing gas in the presence of a catalytic oxide consisting essentially of molybdenum, vanadium, phosphorus, at least one metallic element Y selected from the group consisting of copper, cobalt, zirconium, bismuth, antimony and aresenic, and at least one alkali metal element selected from the group consisting of sodium, potassium, rubidium and cesium, at an atomic ratio of molybdenum to vanadium to phosphorus to the metallic element Y to the alkali metal element to oxygen of 12:0.1-10:0.1-10:a:b:f, wherein "a" is a positive number up to and including 10, "b" is a positive number up to and including 10 and "f" is a value that is determined by the valences and atomic ratios of the other elements present, wherein the vanadium component of said catalytic oxide is in the form of a complex prepared by reacting vanadium pentoxide and orthophosphoric acid.

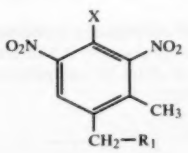
4,180,679

NOVEL SUBSTITUTED DINITROTOLUENES AND METHODS FOR PREPARING THE SAME

Inder P. Kapoor, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 22, 1978, Ser. No. 935,820
Int. Cl.[2] C07C *43/20*
U.S. Cl. 568—583 **10 Claims**

1. A compound of the formula:



wherein X is halogen; R_1 is a member selected from the group consisting of bromine and OR_2; R_2 is a member selected from the group consisting of alkyl C_1–C_4, hydroxyalkyl C_1–C_4 and phenyl.

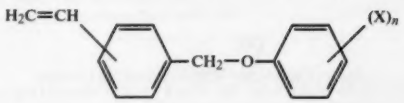
4,180,680

PREPARATION OF HALOPHENYLVINYLBENZYL ETHERS

Kent S. Dennis, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

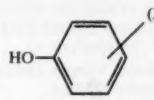
Filed Jul. 28, 1978, Ser. No. 928,663
Int. Cl.[2] C07C *41/04*
U.S. Cl. 568—647 **7 Claims**

1. A process for the preparation of a vinylbenzylhalophenyl ether having the formula:



wherein X is chlorine or bromine and n is an integer 4 or 5, comprising the steps of:

(a) reacting by contacting an alkali metal, alkaline earth metal or ammonium ion salt of a halophenol, which corresponds to the formula:



wherein X and n have the aforesaid meanings, with a vinylbenzyl chloride in a liquid reaction medium consisting essentially of an aqueous solution of from about 68 to about 90 weight percent of at least one C_1 or C_2 alkanol with a remaining amount of water and wherein said contact occurs at a pH from about 7 to about 11 and a temperature less than about 65° C.; and

(b) separating the vinylbenzylhalophenyl ether from the liquid reaction medium.

4,180,681

PREPARATION AND RECOVERY OF METHACRYLIC ACID FROM AN AQUEOUS SODIUM METHACRYLATE SOLUTION

John J. Leonard, Springfield, and Harold Shalit, Bala Cynwyd, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 17, 1978, Ser. No. 934,766
Int. Cl.[2] C07C *57/04*
U.S. Cl. 562—600 **2 Claims**

1. A process for the recovery of methacrylic acid from an aqueous sodium methacrylate solution derived from the silver catalyzed oxidation reaction of methacrolein in an aqueous solution of sodium hydroxide which comprises the steps of:

contacting the aqueous sodium methacrylate solution at a temperature of from about 0° C. to 30° C. with liquid carbon dioxide at its equilibrium vapor pressure to form a methacrylic acid-containing liquid carbon dioxide phase, an aqueous phase and a precipitated sodium bicarbonate phase;

separating the methacrylic acid-containing liquid carbon dioxide phase from the aqueous phase and the precipitated sodium bicarbonate;

lowering the pressure of the liquid carbon dioxide to form gaseous carbon dioxide;

releasing the gaseous carbon dioxide; and

recovering the methacrylic acid.

4,180,682

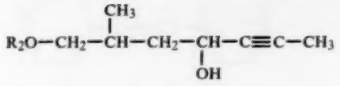
UNSATURATED ALCOHOLS HAVING AN ETHER PROTECTED GROUP

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 796,929, May 16, 1977, Pat. No. 4,107,183, which is a division of Ser. No. 638,722, Dec. 8, 1975, Pat. No. 4,041,058, which is a continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application May 12, 1978, Ser. No. 905,254
Int. Cl.[2] C07C *43/27*
U.S. Cl. 568—662 **7 Claims**

1. A compound of the formula:

(d) fractionating, in a debutanizing zone, said separated



wherein R_2 is t-butyl, tetrahydropyranyl, benzyl, benzhydryl, trityl, methoxymethyl, dimethyl t-butylsilyl.

4,180,683

PROCESS FOR RECOVERING 2,2-BIS(4-HYDROXYPHENYL)PROPANE FROM DISTILLATION RESIDUES FROM THE PREPARATION THEREOF

Lawrence C. Mitchell, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1977, Ser. No. 863,668

Int. Cl.[2] C07C *37/44, 37/38*

U.S. Cl. 568—724 **6 Claims**

1. A process for the production of 2,2-bis(4-hydroxyphenyl) propane from the tarry residue or isomer by-product residue which remains after purification distillation of 2,2-bis(4-hydroxyphenyl) propane produced by the condensation of phenol and acetone, said process comprising:

(i) adding phenol to said residue and forming a warm mixture of said residue and added phenol in the substantial absence of an acidic reagent;

(ii) cooling said mixture to precipitate a crystalline adduct of 2,2-bis(4-hydroxyphenyl) propane and phenol;

(iii) separating the adduct; and

(iv) subsequently recovering said 2,2-bis(4-hydroxyphenyl) propane therefrom.

4,180,684

PROCESS FOR THE PRODUCTION OF 4,4-ISOPROPYLIDENE-BIS'(2,6-DIBROMOPHENOL)

Peter Kleinschmit; Eberhard Walter, both of Hanau; Helmut Mechler, Hofheim; Günter Theis, Hanau, and Brigitte Meiners, Kahl, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jan. 14, 1977, Ser. No. 759,548

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601681

Int. Cl.[2] C07C *37/00*

U.S. Cl. 568—726 **14 Claims**

1. A process for the production of pure 4,4'-isopropylidene-bis (2,6-dipromophenol) comprising reacting 4,4'-isopropylidene diphenol with a brominating agent selected from the group consisting of (1) hydrogen bromide and (2) hydrogen bromide containing up to 1 mole of free bromine per mole of hydrogen bromide and at least about 1.0 mole of hydrogen peroxide for each mole total of hydrogen bromide and free bromine in the presence of water and an inert ogranic solvent which has limited miscibility with water so that two liquid phases are present, one phase being a water phase and the other an organic solvent phase, separating the water phase from the organic solvent phase, precipitating 4,4'-isopropylidene-bis (2,6-dibromophenol) from the organic phase to leave a mother liquor and recycling the mother liquor for use as water immiscible solvent in making another batch of 4,4'-isopropylidene-bis (2,6-dibromophenol).

4,180,685

DEHYDROCHLORINATION OF A DIHYDROXYDIPHENYL TRICHLOROETHANE

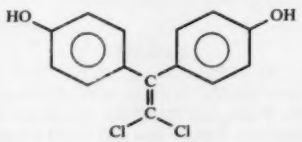
Michael R. MacLaury, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 17, 1979, Ser. No. 4,050

Int. Cl.[2] C07C *37/00*

U.S. Cl. 568—726 **6 Claims**

1. The process for dehydrohalogenating 1,1,1-trichloro-2,2-bis(4-hydroxyphenyl)ethane to form 1,1-dichloro-2,2-bis(4-hydroxyphenyl)ethylene of the formula



which process comprises treating the aforesaid trichloroethane with liquid methyl amine substantially free of solvent.

4,180,686

OXIDATIVE COUPLING OF ALKYLPHENOLS

John R. Dodd, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

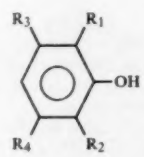
Filed Jan. 25, 1979, Ser. No. 6,419

Int. Cl.[2] C07C *37/00*

U.S. Cl. 568—730 **12 Claims**

1. A method of preparing carbon-carbon coupled condensation products of an alkylphenol, wherein said method comprises contacting said alkylphenol with an effective amount of oxygen or an oxygen-containing gas in the presence of an effective amount of palladium acetate catalyst in a polar solvent which solubilizes palladium acetate under reaction-promoting conditions, said process being characterized further in that:

(A) the alkylphenol is in the group represented by the formula



wherein R_1, R_2, R_3 and R_4 are hydrogen or C_1–C_4 alkyl, with at least two alkyls being present one of which is R_3 or R_4, and

(B) the amounts of materials are as follows, on a molar basis: phenol—1.0; oxygen—about 2.5 to about 100; polar solvent—about 2 to about 30, and palladium acetate—about 0.001 to about 0.5.

4,180,687

REACTION OF FORMALDEHYDE IN BUTYNEDIOL

Harry O. Burrus, and Donald I. Garnett, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 24, 1978, Ser. No. 899,297

Int. Cl.[2] C07C *29/24, 33/04*

U.S. Cl. 568—856 **6 Claims**

1. In a process for the production of crude butynediol containing 0.5–10 weight percent of formaldehyde by the reaction of aqueous formaldehyde and acetylene in the presence of a cuprous acetylide complex the improvement comprising reacting the formaldehyde in the crude butynediol with 0.05 to 1.0 mols of alkali metal hydroxide or carbonate per mol of formaldehyde at a temperature of 140° to 180° C. for a period of time until the formaldehyde is converted into a polymeric substance.

4,180,688
METHOD FOR CONTINUOUSLY PRODUCING TERT-BUTYL ALCOHOL

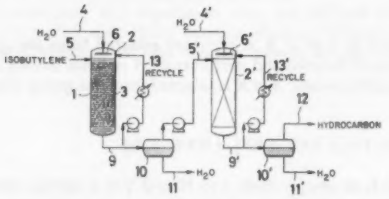
Masao Imaizumi, Tokyo; Mitsuo Yasuda, Kawasaki; Ko Sakata, Tokyo, and Noboru Hirano, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1978, Ser. No. 928,294

Claims priority, application Japan, Jul. 29, 1977, 52/91092; Aug. 8, 1977, 52/94798; Aug. 10, 1977, 52/96232

Int. Cl.[2] C07C *29/04*

U.S. Cl. 568—899 10 Claims



1. In a method of continuously producing tert-butyl alcohol by reacting water with isobutylene in the presence of a strongly acidic cation exchange resin as a catalyst, the improvement which comprises continuously bringing water and liquid C_4 hydrocarbon mixture containing 20–50% isobutylene into contact with each other and a bed of said catalyst particles in a reactor at a temperature of 50°–150° C. under conditions such that said liquid C_4 hydrocarbon mixture is the continuous phase in the gaps between the catalyst particles in said bed said continuous phase being obtained by filling the reactor with a liquid C_4 hydrocarbon mixture and the water flows along the surface of the catalyst particles at an average linear velocity of at least 1.0 m/hr (based on the empty reactor) and continuously withdrawing reaction mixture from the reactor.

4,180,689
PROCESS FOR CONVERTING C_3–C_{12} HYDROCARBONS TO AROMATICS OVER GALLIA-ACTIVATED ZEOLITE

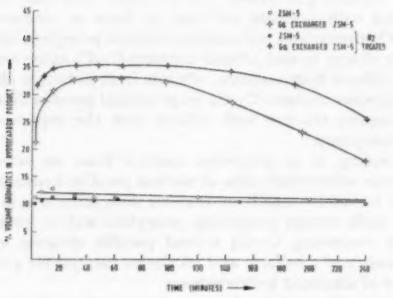
Evan E. Davies, Woking, and Alexander J. Kolombos, Thames Ditton, both of England, assignors to The British Petroleum Company Limited, London, England

Division of Ser. No. 856,668, Dec. 2, 1977. This application Dec. 11, 1978, Ser. No. 968,402

Claims priority, application United Kingdom, Dec. 20, 1976, 53012/76

Int. Cl.[2] C07C *15/02;* B01J *23/08;* C01B *29/28*

U.S. Cl. 585—407 11 Claims



1. A process for producing aromatic hydrocarbons comprising bringing into contact at an elevated temperature a C_3–C_{12} hydrocarbon feedstock with a catalyst composition comprising an aluminosilicate having gallium deposited thereon or an aluminosilicate in which cations have been exchanged with gallium ions, said aluminosilicate having silica to alumina in a molar ratio of between 20:1 and 70:1.

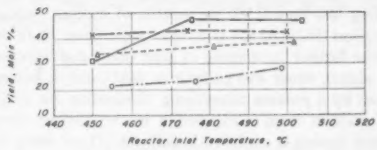
4,180,690
OXYDEHYDROGENATION OF ALKYLAROMATIC HYDROCARBONS AND CATALYTIC COMPOSITE THEREFOR

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 19, 1977, Ser. No. 862,071

Int. Cl.[2] C07C *15/00*

U.S. Cl. 585—443 9 Claims



1. A method for oxydehydrogenating an aromatic input hydrocarbon having at least one dehydrogenatable alkyl group substituent to produce an alkenyl-substituted aromatic product hydrocarbon which comprises contacting the input hydrocarbon, steam and oxygen at oxydehydrogenation conditions, including an inlet reactor temperature of about 470° C. to about 550° C., with a catalytic composite consisting essentially of a combination of cobalt oxide, chromium oxide, alumina and magnesium oxide with a silica carrier material in amounts sufficient to result in a mole ratio of chromium oxide to cobalt oxide of about 0.2:1 to about 2:1, of alumina to cobalt oxide of about 0.05:1 to about 0.5:1 and of magnesium oxide to cobalt oxide of about 0.05:1 to about 0.5:1.

4,180,691
ALKYLATION OF AROMATIC HYDROCARBONS FOR DETERGENT PRECURSORS

George E. Illingworth, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 4, 1978, Ser. No. 931,048

Int. Cl.[2] C07C *3/54*

U.S. Cl. 585—455 5 Claims

1. In a process for the production of detergent alkylate by the acid-catalyzed liquid-phase reaction of a C_7 to C_{20} monoolefin and benzene, resulting in a detergent alkylate having an objectionable 2-phenyl isomer content, the method of reducing said 2-phenyl isomer content of the alkylate which comprises performing said olefin-benzene reaction in the presence of a surfactant.

4,180,692
METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, Mar. 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, Mar. 1, 1971, abandoned. This application Apr. 11, 1974, Ser. No. 459,897

Int. Cl.[2] C07C *3/52*

U.S. Cl. 585—457 2 Claims

1. A process for producing an alkylation reaction product from an alkylatable aromatic hydrocarbon and an alkyl halide which comprises contacting said alkylatable aromatic hydrocarbon with said alkyl halide at alkylation conditions, in the presence of a catalyst selected from the group consisting of benzene molybdenum tricarbonyl, toluene molybdenum tricarbonyl, o-xylene molybdenum tricarbonyl, m-xylene molybdenum tricarbonyl, p-xylene polybdenum tricarbonyl, cumene molybdenum tricarbonyl, and mesitylene molybdenum tricarbonyl.

4,180,693

NEW PREPARATION PROCESS OF A CATALYST FOR CONVERTING AROMATIC HYDROCARBONS

Christian Marcilly, Houilles, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 842,132, Oct. 14, 1977. This application Nov. 30, 1978, Ser. No. 965,466

Claims priority, application France, Oct. 15, 1976, 76 31320; Dec. 22, 1976, 76 39015

Int. Cl.[2] C07C *3/62*

U.S. Cl. 585—475 **11 Claims**

1. In a process for dismutation and transalkylation of alkyl aromatic hydrocarbons in the presence of a catalyst, the improvement comprises employing as said catalyst a mordenite containing less than 0.5% by weight of sodium, wherein the molar ration SiO_2/Al_2O_3 is in the range from 10 to 100, the mordenite further containing at least one metal selected from cobalt, nickel, silver and palladium, said catalyst having been produced by a process comprising eliminating the major portion of sodium from a mordenite in the sodium form; said mordenite having a molar ratio SiO_2/Al_2O_3 of about 10, said catalyst being obtained by incorporating said metal to said mordenite and drying of the resulting catalyst mass at about 50° to 150° C., and subjecting the resultant dried catalyst to a dry calcination between 300 and 700° C., in the presence of an inert or oxidizing dry gas containing less than 1% by volume of steam and then subjecting resultant calcined catalyst to a wet calcination between 250° and 700° C., in the presence of at least one gas selected from steam, an inert gas and an oxidizing gas, the inert or oxidizing gas containing by volume at least 3% of steam.

4,180,694

PRODUCTION OF 1,7-OCTADIENE FROM BUTADIENE

Kenzie Nozaki, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 24, 1978, Ser. No. 927,692

Int. Cl.[2] C07C *11/12*

U.S. Cl. 585—511 **16 Claims**

1. The process of hydrodimerizing butadiene to 1,7-octadiene which comprises contacting the butadiene with a formate of an alkali metal or ammonia, a palladium catalyst, a tertiary phosphine, a solvent selected from the group consisting of dialkyl sulfoxides, N,N-dialkylalkanamides, alkyl substituted and unsubstituted pyridines and sulfolanes and about at least 1 moles of water per mole of formate salt.

4,180,695

ISOPARAFFIN ALKYLATION PROCESS USING AN UNSUPPORTED PERFLUORINATED POLYMER CATALYST

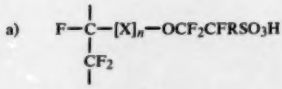
James D. McClure, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,897, Mar. 4, 1976, Pat. No. 4,022,847. This application Dec. 20, 1976, Ser. No. 752,359

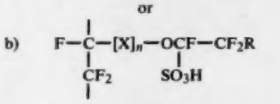
Int. Cl.[2] C07C *3/54*

U.S. Cl. 585—730 **5 Claims**

1. A liquid phase alkylation process which comprises contacting a C_4 to C_6 isoparaffin or mixtures thereof with an olefin selected from the group consisting of C_3 to C_5 monoolefins or mixtures thereof at a reaction temperature of between about 80° C. and about 225° C. in the presence of an unsupported solid perfluorinated polymer catalyst wherein said catalyst contains a repeating structure selected from the group of:

a) 

or

b) 

where n is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoroalkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:

$[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

where m is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and the trifluoromethyl radical.

4,180,696

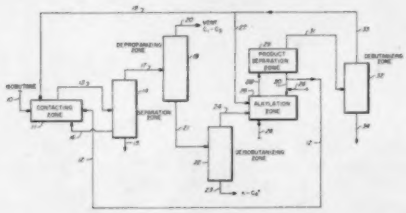
CONVERTING REACTIVE IMPURITIES IN ISOBUTANE CHARGE STREAM WITH CATALYST PHASE IN SULFURIC ACID ALKYLATION

Charles T. Lewis, Jr., Houston, and Gerald F. Prescott, Bridge City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,382

Int. Cl.[2] C07C *3/54*

U.S. Cl. 585—717 **3 Claims**



1. In a sulfuric acid catalyzed alkylation process wherein isobutane is contacted in an alkylation zone with propylene and/or butylene in the liquid phase, in the presence of a sulfuric acid containing alkylation catalyst, under alkylation conditions, and with agitation sufficient to form an emulsion of reactant hydrocarbons and catalyst, wherein propylene and/or butylene charge to said process contains C_3–C_4 range normal paraffin diluent hydrocarbons, wherein fresh isobutane charge to said process contains C_3–C_4 range normal paraffin diluents, and impurities reactive with sulfuric acid; the improvement which comprises:

(a) reacting, in an alkylation reaction zone, an isobutane stream substantially free of normal paraffin hydrocarbon and impurities which are reactive with sulfuric acid with an olefin stream comprising propylene and/or butylenes and containing C_3–C_4 normal paraffin diluents in the presence of a sulfuric acid alkylation catalyst for production of alkylated hydrocarbons;

(b) separating in a product separation zone, the reaction effluent from said alkylation reaction zone into a hydrocarbon phase essentially free of sulfuric acid catalyst and into a catalyst phase;

(c) recycling a major portion of said catalyst phase from said product separation zone to said alkylation reaction zone for said reacting step (a);

hydrocarbon phase into a C_5 and heavier alkylated hydrocarbon product fraction and a recycle hydrocarbon fraction comprising isobutane with minor amounts of normal paraffin hydrocarbons and water;

(e) contacting, in a contacting zone, a minor portion of said catalyst phase from said product separation zone with a fresh isobutane charge stream containing C_3–C_4 normal paraffin diluents, water and impurities reactive with sulfuric acid and with said recycle hydrocarbon fraction from step (d) for conversion of said reactive impurities into compounds soluble in said catalyst phase and for absorption of water into said catalyst phase;

(f) separating, in a separation zone, the effluent from said contacting zone into a catalyst phase containing conversion products of said reactive impurities and absorbed water and into an isobutane phase containing normal paraffin impurities and substantially free of said reactive impurities and water;

(g) fractionating, in a depropanizing zone, said separated isobutane phase into a C_1–C_3 normal paraffin fraction and a depropanizing bottoms fraction comprising isobutane and n-butane;

(h) fractionating, in a deisobutanizing zone, said depropanizing zone bottoms fraction into a butane fraction comprising normal butane and any heavier hydrocarbons, and into an isobutane stream substantially free of normal paraffins, water, and reactive impurities; and

(i) charging said isobutane stream from said deisobutanizing zone to said alkylation reaction zone as the isobutane stream of step (a).

4,180,697

VACUUM OVEN WITH GRAPHITE HEATING

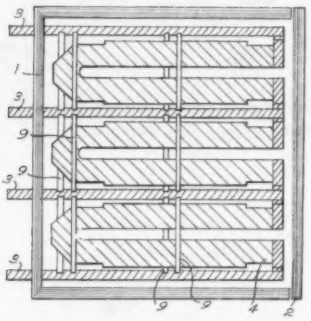
Erwin Schumann, Bruchkobel, and Oskar Bohländer, Grosskrotzenburg, both of Fed. Rep. of Germany, assignors to Deutsche Gold- and Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,582

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1976, 2646890

Int. Cl.² H05B *3/10*

U.S. Cl. 13—25 **6 Claims**



1. In a vacuum furnace provided with graphite heating means and consisting essentially of the furnace body and heating means the improvement comprising said heating means comprising flexible thin graphite solid sheets having a thickness of 0.5–3 mm.

4,180,698

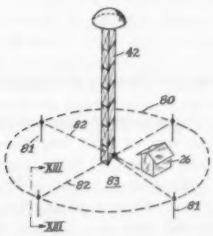
SYSTEM AND EQUIPMENT FOR ATMOSPHERICS CONDITIONING

Roy B. Carpenter, Jr., 17001 Bracewood Dr., Hacienda Heights, Calif. 91745

Continuation-in-part of Ser. No. 651,922, Jan. 23, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,218

Int. Cl.² H02G *13/00;* **H05F** *3/00*

U.S. Cl. 174—2 **3 Claims**



1. A system and equipment for atmospherics conditioning of objects located on the earth's surface to protect them from the effects of atmospherics which are to include but not be limited to such phenomena as lightning, electrostatic fields, electromagnetic fields, field transients, static charge, hail and any other related phenomena

comprising:

at least one discrete ionizer structure rising above the earth's surface and the to be protected objects, selectively, extending upwardly to a specific elevation calculable for the at least one specific intended area of protection provided by a said discrete ionizer structure under a uniform field shape, avoiding field reinforcing at any point,

an endless ground current collector structure having at least one downwardly extending grounded charge collecting rod and disposed horizontally about the base of said discrete ionizer structure and contiguous to the earth's surface, so as to surround the to be protected objects on the earth's surface and thereby establishing an electrically floating island having the area of said calculable intended protection and

a plurality of service wires connecting the base of a said discrete ionizer structure with operationally significant points of said ground collector structure and those of objects on the earth's surface and located within the perimeter of said endless ground current collector structure, selectively.

4,180,699

SHIELDED ELECTRICALLY CONDUCTOR

William A. Hochella, Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 19, 1978, Ser. No. 917,425

Int. Cl.² H01B *5/02*

U.S. Cl. 174—126 CP **5 Claims**

1. A fine magnetically shielded conductor wire consisting of a conductive copper core and a magnetically soft alloy metallic sheath metallurgically secured to said conductive core, said sheath consisting essentially of about 2 to about 5 percent by weight molybdenum, about 15 to about 23 percent by weight iron and about 75 to about 85 percent by weight nickel.

4,180,700

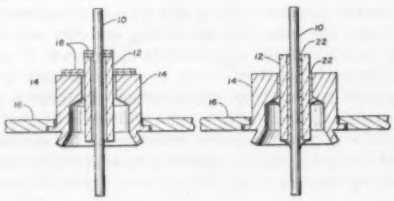
ALLOY COMPOSITION AND BRAZING THEREWITH, PARTICULARLY FOR CERAMIC-METAL SEALS IN ELECTRICAL FEEDTHROUGHS

Robert E. Kraska, Minneapolis, and Joseph F. Lessar, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 13, 1978, Ser. No. 885,489

Int. Cl.² H01B *17/26;* **C03C** *27/04;* **C22C** *5/02*

U.S. Cl. 174—152 GM **15 Claims**



1. An article comprised of at least two members joined together by a thin alloy layer consisting essentially of vanadium, a constituent selected from the group consisting of yttrium, scandium, and mixtures thereof, the balance being gold and minor amounts of incidental impurities, if any.

4,180,701

PHASE LOCK LOOP FOR DATA DECODER CLOCK GENERATOR

Kenneth Louth, Menlo Park, and Luigi C. Gallo, Redwood City, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Jan. 28, 1977, Ser. No. 763,793

Int. Cl.² H04L *7/02*

U.S. Cl. 178—69.1 **6 Claims**

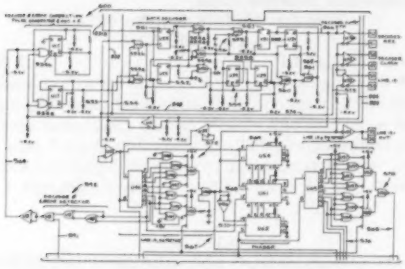
1. Apparatus for phase locking a clock signal to a self clocking data stream having data distributed in regularly occurring data cell intervals, said data defined by a data pulse occurring in the data cell interval with the data pulse interval less than the cell interval, said apparatus comprising:

an oscillator for generating said clock signal, said oscillator responsive to control signals to generate a clock signal of

a frequency and phase varying in accordance with the control signal applied thereto;

first means coupled to said oscillator for supplying said control signal in response to a current being applied thereto;

second means for supplying a predetermined level of current to said first means, said second means responsive to said data stream to supply said predetermined level of current when data pulses are absent from said data stream, said first means responsive to said predetermined level of current to supply a control signal to said oscillator that maintains the frequency of said clock signal substantially at a predetermined rate, said second means rendered inoperative in response to the presence of said data pulses in said data stream; and



third means for supplying a variable interval of current to said first means in response to the occurrence of said data pulses and said clock signal, said third means enabled to supply current to said first means in response to the occurrence of data pulses and disabled from supplying current to said first means in response to the occurrence of a selected signal transition of said clock signal during the interval of said data pulse, the interval of current supplied by said third means varying with the time of occurrence of said selected signal transition during said data pulse interval, said first means responsive to the interval of current supplied by said third means to supply another control signal to said oscillator that maintains the frequency and phase of said clock signal so that said selected signal transition of said clock signal is maintained at the midpoint of said data pulse interval, said third means rendered inoperative in response to the absence of said data pulses.

4,180,702

PHOTO ELECTRIC LIGHT DETECTION DEVICES

Erwin Sick, Icking; Klaus Hartmann, Munich, and Heinz Henneberger, Stockdorf, all of Fed. Rep. of Germany, assignors to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

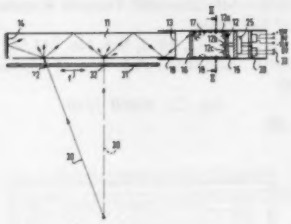
Filed Nov. 22, 1977, Ser. No. 853,889

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654464

Int. Cl.[2] G02B *5/14*

U.S. Cl. 250—227 **28 Claims**

1. A photoelectric light detection device suitable for being disposed at one end face of a light conducting rod and comprising an array of photodiodes, the array of photodiodes being subdivided into at least first and second sub-arrays of photodiodes and the photodiodes of each sub-array being connected together in parallel to a respective current voltage transformer and the outputs of the current voltage transformers being passed to a summing amplifier, there being provided a positive feedback from the output of each current voltage transformer to the photodiodes of the associated sub-array whereby the



capacitive effect of each photodiode sub-array is at least partially compensated.

4,180,703

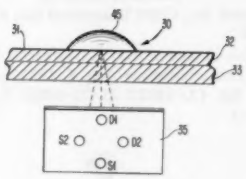
BI-DIRECTIONAL, SELF IMAGING GRATING DETECTION APPARATUS

David R. Cialone, Longmont, Colo., and Donald L. West, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,305

Int. Cl.[2] G01D *5/34*

U.S. Cl. 250—237 G **18 Claims**



1. A bi-directional, self-imaging grating detection apparatus comprising:

a grating comprising a strip of transparent material having first and second sets of light interrupting opaque lines thereon, said first set of lines being positioned above said second set of opaque lines and laterally offset therefrom;

a source-detector assembly comprising first and second pairs of light source and detection devices, each of said pairs comprising a light source means and a light detection means, and positioned on one side of said grating;

at least one of said devices of one of said pairs being aligned with said first set of light interrupting opaque lines and the other of said devices of said pair being aligned with the other set of light interrupting opaque lines;

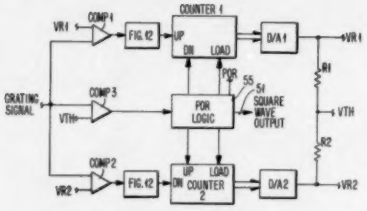
an imaging reflective surface on the opposite side of said strip having a central axis which passes through a point mid way between the light source means and light detection means of each of said pairs of light source and detection devices,

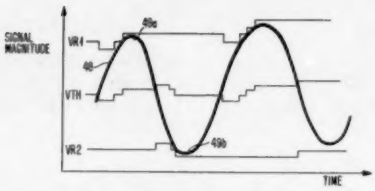
means for effecting relative movement between said grating and said source-detector assembly whereby the images detected in the moving system by the detectors are offset to thereby effect a signal output by said detectors of a different phase relation.

4,180,704
DETECTION CIRCUIT FOR A BI-DIRECTIONAL, SELF-IMAGING GRATING DETECTOR

John W. Pettit, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,306
Int. Cl.[2] H01J 3/14
U.S. Cl. 250—237 G 16 Claims





10. In a bi-directional, self-imaging grating detection apparatus comprising:

a grating comprising a strip of transparent material having first and second sets of light interrupting opaque lines thereon, said first set of lines being positioned above said second set of opaque lines and laterally offset therefrom;

a source-detector assembly comprising first and second pairs of light source and detection devices, each of said pairs comprising a light source means and a light detection means, and positioned on one side of said grating;

at least one of said devices of one of said pairs being aligned with said first set of light interrupting opaque lines and the other of said devices of said pair being aligned with the other set of light interrupting opaque lines;

an imaging reflective surface on the opposite side of said strip having a central axis which passes through a point mid way between the light source means and light detection means of each of said pairs or light source and detection devices;

means for effecting relative movement between said grating and said source-detector assembly whereby the images detected in the moving system by the detectors are offset to thereby effect a signal output by said detectors of a different phase relation;

an improved signal detection circuit comprising: first and second channels each having its input connected to a light detection means output and for providing a predetermined signal output having a predetermined relation to the signal input from said detectors, each of said channels comprising:

means for generating a first voltage reference level for following the peak of the signal waveform;

second means for generating a second voltage reference level for following the valley of the signal waveform;

means for comparing said first and second voltage reference levels with said signal for altering said reference levels until said first and second voltage levels embrace the signal swing of one complete cycle of said signal;

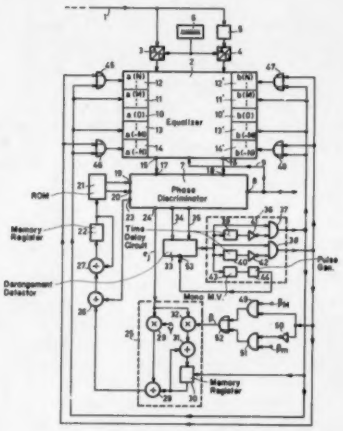
means for continuously deriving from said voltage references a threshold level detection voltage which varies with said first and second voltage references; and

means for continuously comparing said threshold level detection voltage with said signal waveform to create said predetermined signal output therefrom.

4,180,705
ARRANGEMENT FOR THE AUTOMATIC RESYNCHRONIZATION OF A DATA TRANSMISSION RECEIVER

Loic B. Y. Guidoux, and Jean-Louis Renaudat, both of Le'Plessis-Robinson, France, assignors to Telecommunications Radioelectriques et Telephoniques TRT, Paris, France

Filed Oct. 3, 1977, Ser. No. 838,633
Claims priority, application France, Oct. 6, 1976, 76 30034
Int. Cl.[2] H03H 7/36
U.S. Cl. 178—69.1 1 Claim

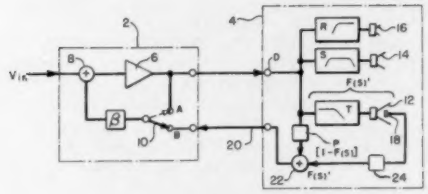


1. An arrangement for the automatic resynchronization of a receiver in a system for data transmission by means of modulating a carrier, the receiver comprising an auto-adaptive equalizer using a predetermined number of adjustable filter coefficients during the transmission, a phase discriminator coupled to said equalizer and having a means for generating a local carrier, a control loop means for locking the local carrier phase on a received carrier, an integrating circuit having a predetermined time constant during the transmission, a memory, and an input means coupled to said discriminator for receiving a phase error signal, a derangement detector having an input coupled to said discriminator and an output means for supplying a derangement indication signal indicating a synchronization loss of the receiver, means coupled to said detector for forming a first and a second command pulse occurring simultaneously with said derangement indication signal and having such a predetermined maximum duration that the duration of the second command pulse exceeds that of the first command pulse and for also forming a brief third command pulse which occurs a predetermined time after the end of the maximum duration of the second command pulse, means for using the first command pulse to make the adjustable filter coefficients of the equalizer and a signal present in the memory of the integrating circuit equal to zero, means for using the second command pulse to make a reduced number of adjustable filter coefficients of the equalizer operative after the end of the first command pulse and to reduce the time constant of the integrating circuit, and means for using the third command pulse to reset the derangement detector.

4,180,706
LOUDSPEAKER MOTIONAL FEEDBACK SYSTEM

Knud E. Bakgaard, Struer, Denmark, assignor to Bang & Olufsen A/S, Struer, Denmark

Filed May 2, 1977, Ser. No. 792,554
Int. Cl.[2] H04R *3/00*
U.S. Cl. 179—1 F **59 Claims**



20. A motional feedback sound reproduction system comprising:

amplifier means for producing an audio signal output;

loudspeaker means responsive to the output of the amplifier and having at least one driver speaker;

transducer means associated with and responsive to one of said at least one driver speaker for providing an output signal indicative of the output of the driver associated with said transducer means;

filter means responsive to the output of the amplifier and adapted to have a transfer function corresponding to the desired transfer function of the driver speaker associated with said transducer means, said filter means providing a reference signal which is a function of said transfer function; and

comparator means responsive to said transducer output signal and said reference signal for providing a differential signal indicative of the difference between said transducer output signal and said reference signal, said differential signal being provided to the amplifier as a feedback signal.

26. An audio signal producing apparatus for use in a motional feedback sound reproduction system having loudspeaker means and external feedback signal providing means, comprising:

amplifier means for providing an audio signal output to the loudspeaker means and operable to provide said audio signal output to a conventional loudspeaker system over the entire audio frequency range, said amplifier means further including feedback input means for receiving an external feedback signal;

feedback coupling means coupled between the feedback signal providing means and said feedback input means for providing to said amplifier means a feedback signal generated by the feedback signal providing means by differencing the measured output of the loudspeaker means with a signal which is a function of the desired output of the loudspeaker means, said feedback signal having a transfer function defined by the expression $1+\Delta F(s)$, wherein $\Delta F(s)$ is the transfer function of the difference between the output of the loudspeaker means and the desired output of the loudspeaker means.

4,180,707
DISTORTION SOUND EFFECTS CIRCUIT

Robert A. Moog, East Aurora, N.Y., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

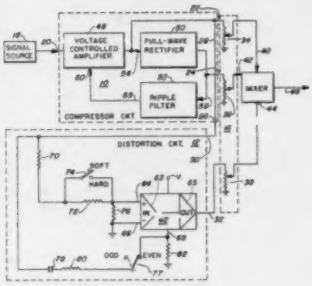
Filed Jun. 21, 1977, Ser. No. 808,503
Int. Cl.[2] G10D *5/00;* **G10H** *1/02*
U.S. Cl. 179—1 M **24 Claims**

1. A distortion sound effects circuit for introducing distortion to an audio signal applied to an input terminal thereof, comprising:

a low-gain semiconductor amplifier having an input and an output, the output from said amplifier not exceeding a predetermined maximum amplitude output level regardless of the input applied to the amplifier;

means for generating a modified signal, the amplitude of which is proportional to said audio input signal;

a distortion control circuit, said modified signal being applied through said distortion control circuit to the input of said amplifier;



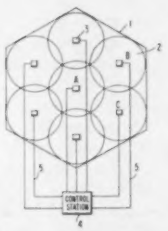
said means for generating a modified signal and said distortion control circuit being normally operative, over the full amplitude range of the audio signal, to maintain the amplitude of the input signal to the amplifier at a level high enough to slightly overload the amplifier, but not high enough to cause the amplifier to clip its output at the amplifier's maximum amplitude output level;

whereby soft type distortion is obtained from the circuit.

4,180,708
FAULT-PROOF SYSTEM FOR MOBILE RADIO COMMUNICATION

Shoshichi Yamaguchi, Hakodate; Sadaatsu Okasaka, Yokohama, and Yoshikazu Takayama, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 30, 1977, Ser. No. 829,110
Claims priority, application Japan, Aug. 30, 1976, 51-102611
Int. Cl.[2] H04B *7/26;* **H04Q** *7/04*
U.S. Cl. 179—2 EB **4 Claims**



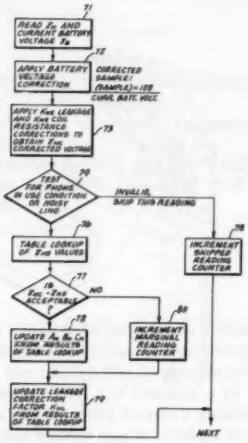
1. In a mobile radio communication system of the type having a composite service area established as an assembly of small zones formed by service areas of a plurality of base stations, respectively, each base station having a radio transmitter installed for its respective small zone, and a control station for sending control signals from said control station through a wire transmission line to allow said respective base stations to modulate carrier waves of one common frequency by said control signals which are mutually in-phase to transmit the modulated carrier waves to mobile units; the improvement comprises in a base station, first means for detecting a phase irregularity of said control signal to produce a first pulse and

second means responsive to said first pulse for interrupting the operation of the radio transmitter of said base station.

4,180,709
DATA COLLECTION SYSTEM USING TELEPHONE LINES

John D. Cosgrove, Playa Del Rey, Calif.; Charles D. Pettis, Panaca, Nev., and Charles E. Mullett, Playa Del Rey, Calif., assignors to International Tel Data Corporation, Las Vegas, Nev.

Filed Feb. 13, 1978, Ser. No. 877,104
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—2 AM **15 Claims**


READ T_B AND CURRENT BATTERY VOLTAGE V_B
APPLY BATTERY VOLTAGE CORRECTION
CORRECTED SAMPLE: (SAMPLE)+(18 CURR. BATT. VOLT.
APPLY K_{RM} LEAKAGE AND K_{WR} COIL RESISTANCE CORRECTIONS TO OBTAIN T_{RM} CORRECTED VOLTAGE
TEST FOR PHONE IN USE CONDITION OR NOISY LINE
INVALID, SKIP THIS READING
TABLE LOOKUP OF T_{RM} VALUES
INCREMENT SKIPPED READING COUNTER
IS $T_{RM} > T_{RX}$ ACCEPTABLE?
NO
UPDATE A_n B_n C_n FROM RESULTS OF TABLE LOOKUP
INCREMENT MARGINAL READING COUNTER
UPDATE LEAKAGE CORRECTION FACTOR K_{RM} FROM RESULTS OF TABLE LOOKUP
NEXT

1. Apparatus for sensing at a central location events occurring at a plurality of remote sites comprising:

one or several switches at each remote site, each switch adapted to change state at the occurrence of an event to be recorded;

resistors associated with said switches for developing a resistance which is a function of said switch settings;

telephone lines coupling said switches and resistors to said central location;

a multiplexer for sequentially selecting each pair of telephone lines;

a means for reading the electrical signal on the selected pair of telephone lines; and

a computer for

(1) computing from said signal the selected line impedance;

(2) adding to said line impedance an impedance correction factor equivalent to the telephone line impedance deviation from nominal, resulting in a computed resistance which is a function of the switched resistance;

(3) using large changes in said computed resistance as a data input; and

(4) using small changes in said computed resistance to improve said impedance correction factor, thereby correcting for the change in telephone line impedance.

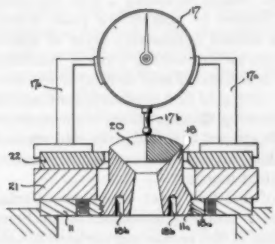
4,180,710
ADJUSTABLY POSITIONED PHASING PLUG

Paul B. Spranger, Fullerton, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Aug. 24, 1978, Ser. No. 936,484
Int. Cl.[2] H04R *9/06, 31/00*
U.S. Cl. 179—115.5 H **5 Claims**

1. In a horn type loudspeaker having a driver unit which includes a centrally positioned magnetic pole piece, a phasing plug fixedly mounted on said pole piece, a magnet unit and top and back plates forming a centrally apertured unitary assembly mounted in external concentricity with said pole piece to form a magnetic gap therebetween, and a diaphragm-voice coil assembly fixedly attached to said unitary assembly having a voice coil mounted in said magnetic gap, the improvement comprising:

means for axially adjusting the position of the phasing plug relative to the diaphragm including a threaded portion of



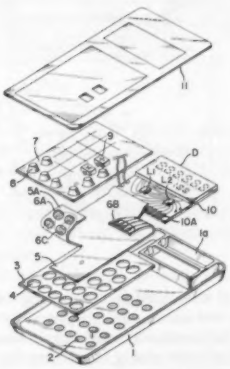
said pole piece and an apertured portion in said unitary assembly in external concentricity with said threaded portion of the pole piece which threadably engages said cylindrical threaded pole piece portion,

whereby the phasing plug is moved axially relative to the mounted position of the diaphragm with relative rotation between the pole piece and the unitary assembly.

4,180,711
DESK-TOP CALCULATOR KEYBOARD SWITCH

Osamu Hirata, and Yuji Harada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1977, Ser. No. 833,344
Claims priority, application Japan, Sep. 14, 1976, 52-110046
Int. Cl.[2] H01H *13/70, 1/02;* **G06F** *15/02;* **H05K** *1/00*
U.S. Cl. 200—5 A **6 Claims**



1. A miniature electronic calculator including digit displaying means, operational means and key input means, said key input means comprising:

a casing for the calculator having first electrical contacts disposed on the inner surface thereof, said first contacts being formed of an electrically conductive material containing carbon particles;

an insulating flexible plate having a first electrically conductive layer carried on a surface thereof facing the inner surface of said casing, portions of a surface of said first layer being coated with a second electrically conductive layer of material containing carbon particles to form second electrical contacts for cooperation with said first contacts; and

an insulating layer intervening between said first layer and said casing for covering that portion of the surface of said first layer which is not coated with said second layer.

5. A key input assembly for use in miniature electronic apparatus comprising:

first contact means formed of an electrically conductive material containing carbon particles, said first contact means including a plurality of contacts arranged separately from each other so as to form a matrix;

second contact means including a first electrically conductive layer formed of conductive paint containing silver particles, a second conductive layer of electrically conductive material containing carbon particles overlying portions of a surface of said first layer for making electrical contact with said first contact means, and an insulating layer for covering those portions of the surface of said first layer which are not overlaid with said second layer; and

means for making an electrical contact between said first and second contact means;

the portions of said first layer which are overlaid with said second layer of said second contact means being formed as pairs of contacts, the remaining portions of said first layer, which are covered with said insulating layer, including wiring conductors associated with the pair of contacts.

4,180,712

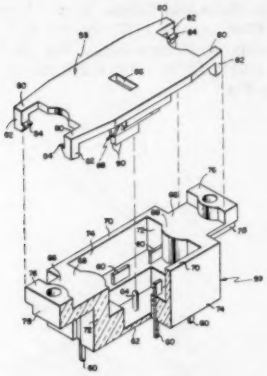
SLIDE SWITCH

Kurt Lutzenberger, Arlington Heights; James R. Bailey, Chicago, and James M. Hybl, Riverside, all of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Jul. 13, 1978, Ser. No. 924,278

Int. Cl.[2] H01H *15/02*

U.S. Cl. 200—16 D **3 Claims**



1. An electrical slide switch comprising two-piece casing including a base, and an actuator, a plurality of fixed electrically conducting terminals mounted in said base and extending into the interior of said casing, said actuator being slidably mounted on the upper surface of said base, an electrical conductor blade carried by said actuator and movable therewith into contact with selected terminals, yieldable detent means for retaining said actuator in a selected rest position comprising a rigid element carried by said base interiorly of the casing and projecting upwardly toward said actuator, and control means carried by said actuator and in engagement with said element, said base having a boxlike shape with the upper end surfaces of its walls lying in a common plane, said base having mounting means comprising longitudinally protruding end portions extending beyond the end walls thereof, said end portions having upper surfaces lying substantially in the plane of the upper surface of the base, said portions further having upstanding barriers thereon, said upstanding barriers having upper surfaces disposed in the plane of the upper surface of the actuator, and resilient means carried by said actuator for yieldably retaining said actuator in assembled relation with the casing comprising integral end portions on said actuator having means for yieldably interlocking with end portions of said casing.

4,180,713

SWITCH CONTROL UNIT FOR AUTOMOBILE VEHICLE

Boris Gonzales, Issy-les-Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

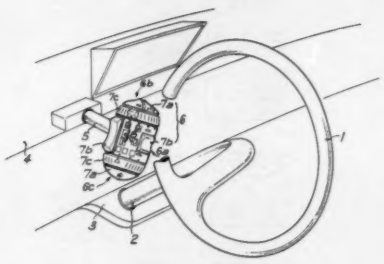
Continuation of Ser. No. 698,680, Jun. 22, 1976, abandoned.

This application Jan. 23, 1978, Ser. No. 871,750

Claims priority, application France, Jun. 25, 1975, 75 19965

Int. Cl.[2] H01H *9/00;* **B60K** *37/06;* **B60R** *18/00;* **H01H** *25/06*

U.S. Cl. 200—52 R **7 Claims**



1. In an automobile vehicle provided with a steering wheel, with electrical means for controlling and checking the operation of various accessories of said vehicle and with a control unit constituted by a compact box located near said steering wheel and comprising a central part and two ends, a support attached to a fixed member of said vehicle and orientable and extendable with respect to said fixed member, said box being laterally connected to said support, said control means being constituted by hand-operated switches electrically connected by wires to said accessories and located and borne by said central part and said ends of said box, an improvement of said control unit in which said central part is substantially cylindrical and at least one of said switches is borne on said box to have rotatable direction of actuation about the axis of said cylindrical central part.

4,180,714

PRESSURE-DEPENDENT ELECTRIC SWITCHING DEVICE

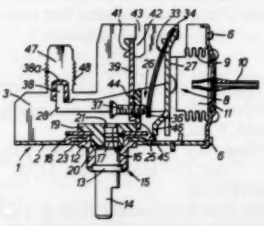
Peter R. Hansen, Nordborg, and Niels P. Thorsen, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jun. 2, 1978, Ser. No. 911,882

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726608

Int. Cl.[2] H01H *35/32*

U.S. Cl. 200—81 R **17 Claims**



1. A pressure responsive electric switching assembly, com-

prising, a one piece sheet metal carrier having a base wall and two parallel sidewalls extending therefrom, an insulated housing containing an enclosed switching system and having an aperture through which said switching system can be actuated, said housing being connected to said carrier, a bell crank plate pivoted to said carrier and having an actuating element extending through said housing aperture for actuating said switching system, a pressure influenced operating element biasing said actuating element in one direction, spring means biasing said actuating element in the other direction, a rotary servo-element mounted on said carrier and having means for adjusting the spring tension of said spring means, a pair of vertically extending lug elements formed by said sidewalls, said insulated housing having wall means with grooves which receive said lug elements in press fitting relation for connecting said housing to said carrier.

4,180,715

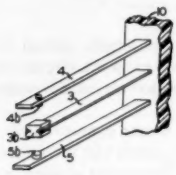
VITAL MOVABLE ELECTRICL CONTACT ARRANGEMENT

William J. Lichtenberger, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 5, 1978, Ser. No. 903,272

Int. Cl.[2] H01H *1/24, 1/26, 1/28*

U.S. Cl. 200—246 **11 Claims**



11. A fail-safe transfer switching assembly comprising, a plurality of movable heel and stationary front and back leaf spring contact members, a molded insulative contact block for retaining said leaf spring contact members in spaced relationship with each other, a plug-in terminal portion formed on one end of each of said leaf spring contact members, a silver contact button rivoted to the other end of each of said front and back leaf spring contact members, a silver impregnated carbon contact block soldered to a bifurcation formed on the other end of said movable heel leaf spring contact member for preventing welding of said silver contact buttons of said front anb back leaf spring contact members.

4,180,716

SWITCH HAVING LOCK-OFF AND LOCK-ON

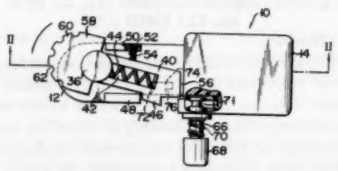
Hideo Suzuki, Yokohama, Japan, assignor to Fujisoku Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 9, 1978, Ser. No. 959,092

Claims priority, application Japan, Nov. 15, 1977, 52-153184[U]

Int. Cl.[2] H01H *3/20, 13/08*

U.S. Cl. 200—320 **8 Claims**



1. A locking switch comprising a switch case, a compression spring disposed in the switch case and a slider which is urged outwardly from the switch case by the compression spring and which can be locked in off-position, said switch further comprising:

a lock plate rotatably disposed on the slider and having a projection at one side thereof and a hole elongated along the length of the lock plate;

a pin secured to the slider and loosely inserted in the elongated hole of the lock plate to rotatably retain the lock plate;

first biasing means disposed in the elongated hole and between the pin and one end of the elongated hole for urging the lock plate toward the switch case;

a stopper engageable with the projection of the lock plate for stopping the slider; and

second biasing means disposed at the other side of the lock plate for urging the projection into engagement with the stopper thereby to prevent a pulling of the slider.

4,180,717

INDUCTIVELY HEATABLE GODET WITH INSULATING MEANS

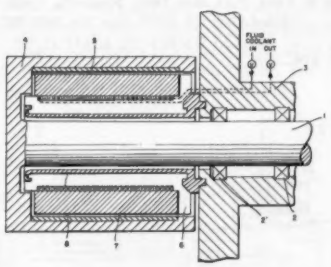
Erich Lenk, and Karl Bauer, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,521

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647540

Int. Cl.[2] H05B *5/08*

U.S. Cl. 219—10.49 A **2 Claims**



1. An improved inductively heated godet of the type wherein a drive shaft drives a rotatable hollow casing which is secured to the end of the drive shaft and a heating device is located between the drive shaft and casing on the machine frame, the heating device comprising an induction coil placed about a magnetic core formed by a laminated pack, the improvement comprising:

an elastic intermediate piece having a hose-like hollow chamber located between the laminated pack and said coil and extending over the length of said laminated pack, said hose being expandable when filled with a fluid coolant to secure said coil about said laminated pack; and

inlet and outlet means to circulate a fluid coolant through the expandable hose under pressure.

4,180,718

APPARATUS AND SYSTEM FOR PROCESSING OIL SHALE

Lester Hanson, 1903 Princeton Ave., Salt Lake City, Utah 84108

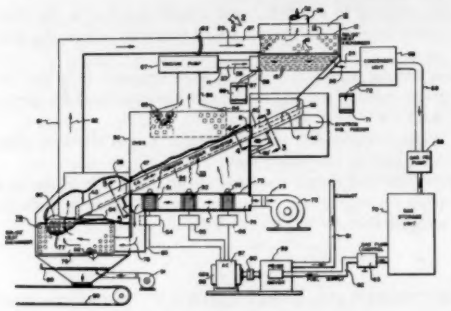
Division of Ser. No. 721,946, Sep. 10, 1976, Pat. No. 4,065,361. This application Oct. 31, 1977, Ser. No. 847,058

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 A **9 Claims**

1. In combination, an oil-shale processing microwave oven having opposed openings, a reciprocating conveyor having a feed end and a discharge end and disposed in and through said

oven at said openings, said conveyor sloping downwardly from said feed end to said discharge end and comprising a rigid, unitary, homogeneous, ceramic, elongate, vibrating member and a pair of metallic supports facing said openings, receiving opposite ends of said vibrating member, and support-



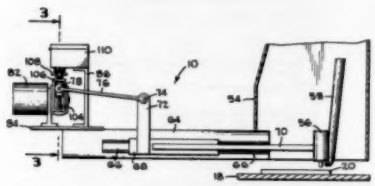
ingly connected to said oven, and means for vibrating said member coupled thereto, and wherein said vibrating member comprises an upwardly open channel having vertically depending structural cooling fins disposed solely between said supports.

4,180,719

TUNGSTEN CARBIDE IMPREGNATOR

Kenneth V. Lutz, P.O. Box 1467, Roseville, Calif. 95678

Filed Dec. 12, 1977, Ser. No. 859,797
Int. Cl.[2] B23K *9/30;* **F16H** *35/08*
U.S. Cl. 219—125.12 **9 Claims**



1. A continuous welding machine having a mechanism for oscillating the welding head across the weld area, said machine including a slide connected to said welding head and a drive arm connected to said slide, the improvement comprising:

(a) an adjustment shaft with an axis;

(b) carrier means supporting said adjustment shaft for rotation about the axis of said adjustment shaft and against displacement in the axial direction of said adjustment shaft;

(c) drive means connected to said carrier means for imparting rotation to said adjustment shaft about a drive axis;

(d) rotatable means mounted on said adjustment shaft in fixed relation thereto and having an axis coincident with the axis of said adjustment shaft;

(e) abutment means engaging said rotatable means to turn said adjustment shaft about its axis,

(f) a connector carried by said adjustment shaft for rotation therewith about said drive axis and movable along the axis of said adjustment shaft in response to said adjustment shaft turning about its axis through the engagement of said abutment means with said rotatable means;

(g) drive linkage means pivotally connected to said connector to be driven over an eccentric path in response to the rotation of said adjustment shaft about said drive axis, the displacement of said drive linkage means over its eccentric path being controlled by the location of said connector along the axis of said adjustment shaft; and

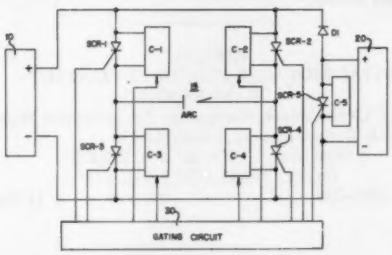
(h) actuating means selectively operated for moving said abutment means into and out of engagement with said rotatable means.

4,180,720

WELDING POWER SUPPLY

Ralph E. Barhorst, Troy, Ohio, assignor to Hobart Brothers Company, Troy, Ohio

Filed Jun. 15, 1978, Ser. No. 915,813
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—130.51 **4 Claims**



1. A welding power supply system for supplying square wave welding current to an arc circuit comprising

first power source having an adjustable controlled direct current output,

switching circuit means connected between the output of said first power source and the arc circuit for controlling the polarity of the current applied thereto,

control circuit means connected to said switching circuit means for controlling the polarity and duration of the current to said arc circuit,

second power source having a substantially constant direct current output connected to said arc circuit,

shorting means connected across the output of said second power source and being responsive to said control circuit means whereby the current from said second power source is added to the arc circuit only during one polarity of the square wave current applied thereto, and

means for isolating the shorting means from the arc circuit while the output of said second power source is short circuited.

4,180,721

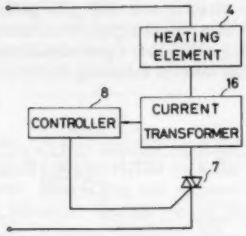
METHOD OF CONTROLLING FIXING TEMPERATURE OF POWDER IMAGE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

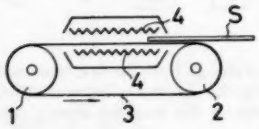
Tsutomu Watanabe, Tokyo; Nobuyuki Yanagawa, Chigasaki, and Masao Hosaka, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Sep. 12, 1977, Ser. No. 832,744
Claims priority, application Japan, Sep. 22, 1976, 51-114076
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **6 Claims**

1. A method of controlling the fixing temperature of a heating element contained in a fixing unit to maintain the fixing temperature constant despite fluctuations in the voltage of a power source supplying the heating element, the method comprising the steps of detecting the current supplied to the heating element using a current transformer to detect the power supplied from the power source to the heating element to provide an output control signal corresponding to the power supplied to the heating element; and utilizing such output

control signal to modulate the power supplied to the heating element to maintain constant the supply power to maintain the





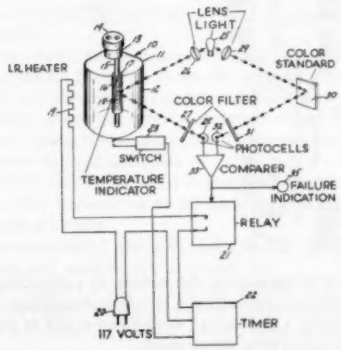
fixing temperature constant despite fluctuations of the voltage of the power source.

4,180,722

LIQUID HEATING DEVICE

Bonnie Clewans, 214-05 23rd Ave., Bay Terrace, N.Y. 11360

Filed Jul. 7, 1977, Ser. No. 813,640
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—502 **4 Claims**



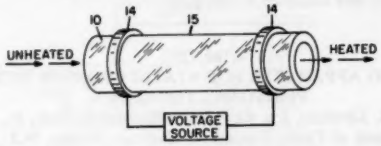
1. As a new article of manufacture, a transparent bottle for containing surgical dialysate and similar fluids comprising: a main body defining a cavity for the holding of said fluid, a neck portion communicating with said cavity, a stopper selectively engageable within said necked portion, an air inlet tube supported by said stopper, a hollow transparent sleeve carried by a segment of said air inlet tube, and a color variable temperature sensitive means including a quantity of temperature sensitive liquid crystals carried by said sleeve and visible through said body.

4,180,723

ELECTRICAL CONTACTS FOR ELECTRICALLY CONDUCTIVE CARBON GLASSES

Raymond E. Szupillo, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,771
Int. Cl.[2] H05B *3/08*
U.S. Cl. 219—541 **17 Claims**



1. A high-use-temperature electrical contact for carbon-containing glass which comprises:

(a) a continuous layer of a soft glass-adherent metal positioned on the carbon-containing glass and in contact with a conductive carbon phase therein, the layer providing electrical contact with the carbon phase; and

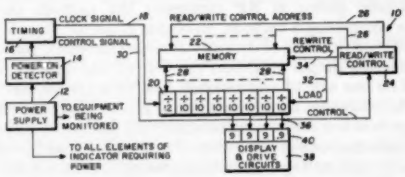
(b) a metallic compression electrode positioned over the layer of soft, glass-adherent metal and in electrical contact therewith, the compression electrode being adapted to maintain compressive stress between the layer and the carbon-containing glass at temperatures up to and including the use temperature of the electrical contact.

4,180,724

SOLID STATE DIGITAL RUNNING TIME INDICATOR

Clyde L. Councilman, and Harry D. Shearer, both of St. Petersburg, Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Mar. 31, 1978, Ser. No. 892,129
Int. Cl.[2] G07C *1/02*
U.S. Cl. 235—92 T **16 Claims**



1. An electrically energizable solid state running time indicator for accumulating and storing for outputting the total time a monitored event is energized, comprising;

means for simultaneously energizing said indicator and said monitored event;

means for detecting the energization of said indicator and said monitored event;

means for enabling a timing circuit in response to said detecting means indicating the energization of said indicator and said monitored event;

said timing circuit including means for generating a clock pulse signal of predetermined constant frequency;

counters for counting up the clock pulse signals generated by said timing circuitry and applied to said counters for accumulating the time said monitored event is energized, the contents of said counters corresponding to the total running time said monitored event is energized;

memory means interconnected with said counters for storing the total running time said monitored event is energized, said memory means having the capability of retaining stored information when the running time indicator is de-energized;

control circuitry for initially loading the accumulated running time stored in said memory means into said counters

in response to a signal generated by said timing circuitry when said indicator is initially energized;

said control circuitry including means for writing the total running time from said counter into said memory means after each predetermined increment of time measured by said predetermined clock pulse signal for continually updating said memory means with the current accumulated running time of the monitored event; and

means for outputting the total running time in said counters when said indicator is energized.

4,180,725

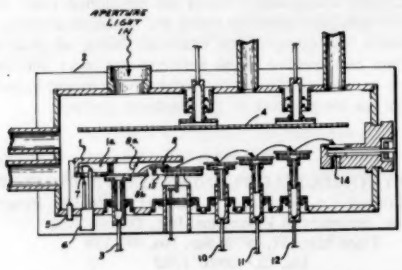
GATING APPARATUS FOR STATIC CROSSED FIELD PHOTOMULTIPLIERS

Wayne G. Abraham, Los Altos Hills; Richard S. Enck, Jr., San Jose, both of Calif.; Ronald H. Goehner, Wayne, N.J., and Robert V. Brick, Sunnyvale, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1978, Ser. No. 904,965

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—207 **4 Claims**



1. In a static crossed field photomultiplier, apparatus for periodically gating at RF frequency the cathode current therein comprising a cathode, an output collector spaced from said cathode, a series of dynodes arranged between said cathode and said output collector, the first of said dynodes positioned on one side of said cathode, said first dynode having a hole therethrough, a gating electrode placed along a constant voltage field line in said crossed static field photomultiplier and also positioned on the other side of said cathode, and Rf drive means for said gating electrode operating so that without RF gating drive input the cathode current is unaffected and said series of dynodes amplifies said cathode current and upon introduction of said RF gating drive input the cathode current alternately flows through said hole in said first dynode to cut off the collector output and then strikes said first dynode for amplification in the remaining dynodes and to provide a collector output.

4,180,726

SYSTEM FOR MEASURING CHARACTERISTICS OF AN OBJECT'S MOTION

Ronald DeCrescent, 17613 Sunburst St., Northridge, Calif. 91325

Filed Feb. 1, 1978, Ser. No. 874,110

Int. Cl.[2] G01D *21/04*

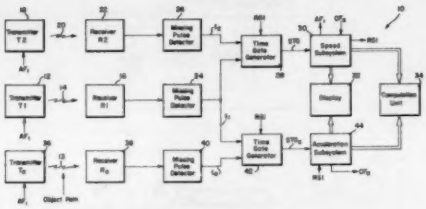
U.S. Cl. 250—222 R **16 Claims**

1. A measurement system adapted for measuring characteristics of an object's motion through a preselected zone, said system comprising:

transmitter means for transmitting first and second substantially parallel, synchronously pulsed beams of infrared energy such that said preselected zone is defined by said beams, and each beam has a predetermined fixed time interval between its energy pulses;

receiver means disposed for receiving, in the absence of beam interruptions, a portion of the transmitted energy in said first and second beams, and for providing output signals indicative thereof;

missing pulse detector and time gate generator means, responsive to said output signals from said receiver means, for producing a time gate signal which commences during the interpulse interval following the first missing pulse in



the received energy from the first beam and which terminates during the interpulse interval following the first missing pulse in the received energy from the second beam; and

speed subsystem means, responsive to said time gate signal, for producing a first speed signal indicative of the speed of the object as it passes through said zone.

4,180,727

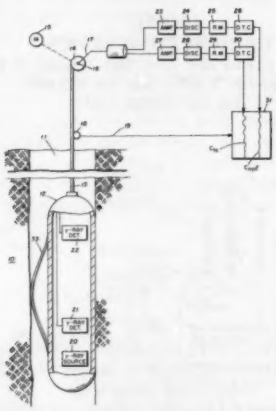
GAMMA-GAMMA DENSITY LOGGING METHOD

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,909

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—264 **5 Claims**



1. A method of measuring the density of radioactive ore-bearing formations surrounding a borehole employing a logging sonde having a gamma-ray source and a pair of gamma-ray detectors, comprising the steps of:

(a) determining a proportionality constant K relating the count rate of one of said pair of gamma-ray detectors to the other of said gamma-ray detectors when both detectors are measuring natural gamma rays from the same radioactive formation, and

(b) logging the formations surrounding the borehole by:

(i) advancing the logging sonde through the borehole while irradiating the formations with gamma rays,

(ii) producing a first count-rate signal by detecting only natural gamma rays with a first of said detectors,

(iii) producing a second count-rate signal by detecting

both scattered gamma rays and natural gamma rays with a second of said detectors,

(iv) modifying said first count-rate signal by the proportionality constant K, and

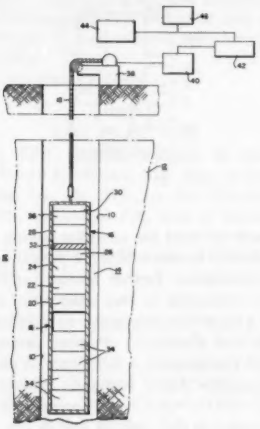
(v) correcting said second count-rate signal by said modified first count-rate signal to produce a density log of the formations surrounding the borehole.

4,180,728

NEUTRON ACTIVATION PROBE FOR MEASURING THE PRESENCE OF URANIUM IN ORE BODIES

Norman P. Goldstein, Murrysville, and Richard C. Smith, O'Hara Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1978, Ser. No. 895,323
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—264 10 Claims



1. A neutron activation probe for assaying the amount of uranium isotopes in an ore body comprising:

a casing;

drive means located above ground and attached to said casing for moving said casing through a boreho' in said ore body;

neutron source means disposed in said casing for emitting neutrons for fissioning fissionable isotopes within said ore body and consequently emitting delayed neutrons;

a plurality of delayed neutron detectors arranged colinearly in said casing below said neutron source means for detecting said delayed neutrons;

a NaI (T1) counter disposed in said casing for detecting the 2.62 MeV line emitted by the naturally occurring thorium in said ore body;

neutron monitoring means disposed in said casing for monitoring said neutron source means; and

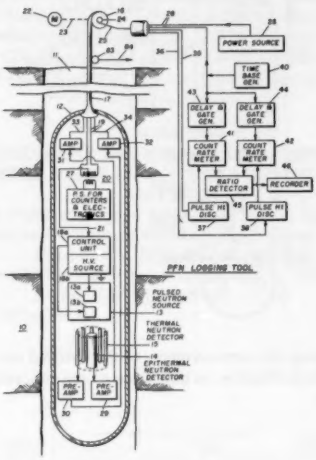
control means for controlling the pulsing of said neutron source means, for registering the signals from said delayed neutron detectors and said counter between pulses of said neutron source means, for delaying the signal of each of said delayed neutron detectors by an amount sufficient to correspond each of said signals with the same ore zone of said ore body and for adding each of said signals so delayed, and for processing the signal from said counter and subtracting the processed signal from said counter from the sum of the signals from said delayed neutron detectors for each section of ore zone and displaying the result with the result being indicative of the amount of uranium present in the ore body without being influenced by the amount of thorium present therein.

4,180,729

URANIUM LOGGING IN EARTH FORMATIONS

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 785,624, Apr. 7, 1977, abandoned. This application Jan. 12, 1978, Ser. No. 868,947
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—265 14 Claims



1. A method for determining uranium ore grade comprising the steps of:

(a) irradiating a known concentration of uranium with a steady source of fast neutrons,

(b) determining the ratio of epithermal to thermal neutron fluxes in said known concentration of uranium in response to the irradiation of step (a),

(c) irradiating an unknown concentration of uranium with a steady source of fast neutrons,

(d) determining the ratio of epithermal to thermal neutron fluxes in said unknown concentration of uranium in response to the irradiation of step (c),

(e) irradiating said unknown concentration of uranium with repetitive bursts of fast neutrons,

(f) determining the ratio of epithermal to thermal neutron fluxes in said unknown concentration of uranium in response to the irradiation of step (e) during the period of time that prompt neutrons are being produced from neutron fission of said unknown concentration of uranium, and

(g) comparing the ratios determined in steps (b), (d), and (f) as an indication of the ore grade of said unknown concentration of uranium.

4,180,730

LOGGING TECHNIQUE FOR ASSAYING FOR URANIUM IN EARTH FORMATIONS

Wyatt W. Givens, and William R. Mills, Jr., both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

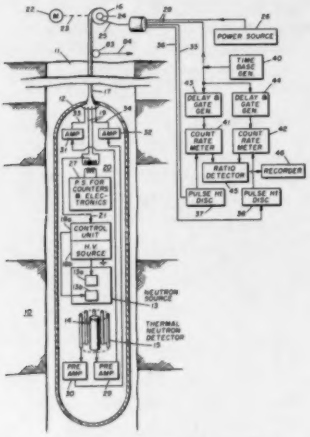
Continuation-in-part of Ser. No. 759,929, Jan. 17, 1977, abandoned. This application Jan. 12, 1978, Ser. No. 868,948
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—265 13 Claims

1. A method of assaying for uranium in formations traversed by a borehole, comprising the steps of:

(a) cyclically irradiating a formation of interest suspected of containing uranium with bursts of fast neutrons,

(b) measuring the thermal and the epithermal neutron fluxes within each cycle of operation when prompt neutrons

resulting from neutron fission of uranium are expected to be detected, and



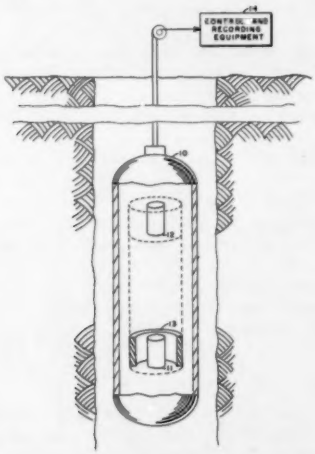
(c) comparing the measurements of the thermal and epithermal neutron fluxes as an indication of the concentration of uranium.

4,180,731

RADIOACTIVE LOGGING SONDE INCLUDING MEANS FOR MONITORING NEUTRON SOURCE OUTPUT

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,266
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 **8 Claims**



1. A method of monitoring the output of a radioactivity borehole logging tool having a pulsed neutron source and a gamma-ray detector, comprising the steps of:

(a) positioning a material susceptible to neutron activation about the neutron source,

(b) operating said neutron source during a time period sufficient to activate said material,

(c) moving said material to a position about the gamma-ray detector, and

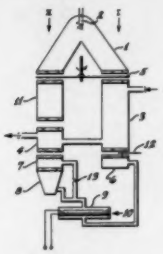
(d) monitoring the output of said gamma-ray detector as it is irradiated with gamma rays from said material as a measure of the output of said neutron source.

4,180,732

NONDISPERSIVE INFRARED GAS ANALYZER

Walter Fabinski, Hattersheim, and Udo Deptolla, Ober-Olm, both of Fed. Rep. of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,639
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748089
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—344 **6 Claims**



1. A two beam infrared gas analyzer having means for providing two radiation beams which are periodically intercepted for intensity modulation; further having pressure differential sensing means connected to two absorption chamber means and including a capacitor responsive to a differential chamber as between the two absorption chamber means to provide an electrical signal representing a difference in absorption by the two chamber means, there being an additional absorption chamber filled with the same kind of sample gas to be detected and being disposed in the path of one of the beams, the improvement comprising:

a first cell being passed through by the gas to be analyzed and disposed in the path of the other one of the two radiation beams as modulated but optically in front of one of the two absorption chamber means; and

a second cell also being passed through by gas to be analyzed, and being shorter than the first cell in direction of beam propagation and being disposed in the path of the one beam in front of the other absorption chamber means.

4,180,733

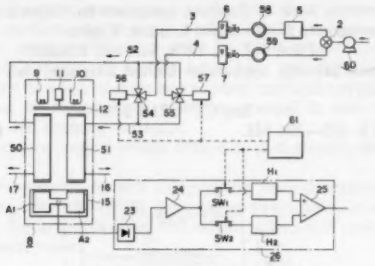
INFRARED RAY GAS ANALYZING APPARATUS

Shinya Ueda, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 2, 1978, Ser. No. 912,144
Claims priority, application Japan, Jun. 2, 1977, 52-70714[U]
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—345 **2 Claims**

1. An infrared ray gas analyzing apparatus of the type having a first cell irradiated by a first light beam of infrared rays, a second cell irradiated by a second light beam of infrared rays, a gas supply means for supplying a sample gas to said first cell during a first period of time and a reference gas to said first cell during a second period of time, a detector for receiving and comparing said first and second light beams passed through said first and second cells and providing an output signal, and a signal process circuit having a first output signal holding circuit for storing the output of said detector during said first period of time, a second output signal holding circuit for storing the output of said detector during said second period of time and a differential amplifier to which the outputs of said first and second signal holding circuits are applied, said ampli-

fier providing the analyzer output signal, wherein the improvement comprises:



said gas supply means supplying said reference gas to said second cell during said first period of time and supplying said sample gas to said second cell during said second period of time.

4,180,734

GAS ANALYZER

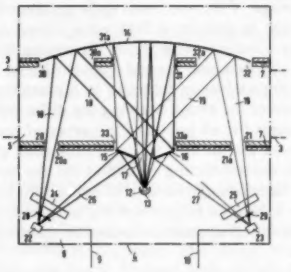
Andras Gedeon, Täby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,449

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707090

Int. Cl.[2] G01J *1/00, 1/42*

U.S. Cl. 250—345 **2 Claims**



2. A gas analyzer having a respiratory tube through which the respiratory gas flows for analysis, a radiation source which radiates through the respiratory tube, radiation receiving means, reflector means which direct the radiation onto the radiation receiving means, and several radiation filters, each of which is assigned to one gas, characterized in that the reflector means (**14, 15, 16**) are constructed and arranged so that the radiation is divided into two beams of radiation (**18, 19**) each of which exits through a window (**20, 21, 20***a*, **21***a*), that the receiving means comprises two radiation detectors (**22, 23**), each of which detects one beam of radiation (**18, 19**) issuing from the respiratory tube (**5**), and that the radiation filters (**24, 25**), each assigned to a specific gas, are arranged in each case before a respective one of the radiation detectors (**22, 23**), and further characterized in that the reflector means comprises concave reflector means (**14**) disposed opposite the radiation source (**12**), and two obliquely arranged plane reflectors (**15, 16**) lying symmetrically at an angle to one another opposite the concave reflector means (**14**), that a clearance (**17**) is left between the plane reflectors (**15, 16**) through which the radiation of the radiation source (**12**) is focused to a beam of radiation striking the concave reflector means (**14**) and that the angle of inclination of the plane reflectorv (**15, 16**) is selected so that they each reflect a portion of the beam of radiation after reflection at the concave reflector means (**14**), in each case through a window (**20, 21**), and further characterized in that the obliquely arranged reflectors (**15, 16**) are reflective on both sides, that the radiation of the radiation source (**12**) is also aligned directly onto the side of the reflectors (**15, 16**) which is facing the radiation source (**12**), and the reflectors (**15, 16**) are aligned so that they direct this primary radiation in separate beams of radiation (**26, 27**) via the filters (**24, 25**) onto the detectors (**22, 23**) so that each detector (**22, 23**) is struck by a beam of radiation (**26, 27**) via the assigned filter (**24, 25**), and that a radiation interrupter (**28, 29**) is disposed before each detector (**22, 23**) which alternately interrupts the two beams of radiation (**18, 19**, and **26, 27**) striking the detectors (**22, 23**).

4,180,735

METHOD AND DEVICE FOR MEASURING THE PARTICLE SIZE IN A SLURRY OR A FLOW OF MATERIAL

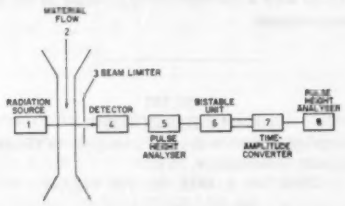
Heikki J. Sipilä, and Seppo J. Uusitalo, both of Espoo, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Sep. 1, 1977, Ser. No. 829,959

Claims priority, application Finland, Sep. 8, 1976, 762578

Int. Cl.[2] G01N *23/00, 21/24*

U.S. Cl. 250—358 R **2 Claims**



1. A method for determining the particle size distribution in a flow of material which includes particles capable of absorbing X-rays dispersed in a medium through which X-rays pass freely, comprising the steps of causing the material to flow as a thin stream at a constant velocity transversely through a narrow X-ray beam consisting of quanta which are absorbed when such quanta encounter the particles in said stream; limiting the thickness of said stream and limiting the thickness of said beam for generally precluding the presence of several of said particles in said beam at any given time, whereby absorption of quanta generally represents passage of single particles through the beam; measuring the time interval distribution of radiation quanta which have passed through the stream to obtain measurements representing absorption of quanta by particles, which measurements carry information about particle size distribution; subtracting from said measurements the values of a Poisson distribution known to represent the time interval distribution of quanta in the beam prior to passage of the beam through the stream; and determining particle size distribution arithmetically on the basis of the difference in said known and measured time interval distributions.

4,180,736

USE OF A LARGE TIME-COMPENSATED SCINTILLATION DETECTOR IN NEUTRON TIME-OF-FLIGHT MEASUREMENTS

Charles D. Goodman, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

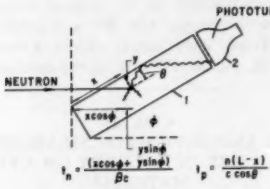
Filed Sep. 25, 1978, Ser. No. 945,375

Int. Cl.[2] G01T *1/20, 3/00*

U.S. Cl. 250—363 R **3 Claims**

1. A method for providing time compensation in a cylindrical scintillator, which is serially connected to a phototube and a counter, utilized in neutron time-of-flight measurements of a neutron beam striking said scintillator thereby creating photons at points of scintillations within said scintillator, and pro-

viding adequate time resolution in said measurements, comprising the steps of: orienting the axis of said scintillator at a desired tilt angle with respect to said neutron beam as a function of the energy of said neutron beam such that the sum of the transit times of said neutrons and said photons in said scintillator are substantially independent of the points of scintillations,



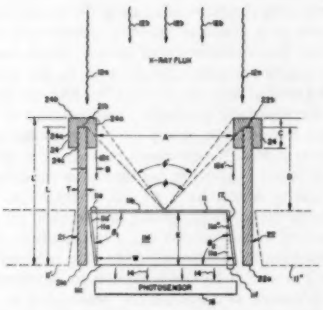
thus achieving said time compensation; and utilizing extrapolated zero timing in said counter to provide compensation for both variable amplitudes and for variable rise-times of said photons, thus achieving said adequate time resolution; whereby the volume of said scintillator can be increased by a factor of 10–20 with a corresponding increase in the data rate of said measurements.

4,180,737

X-RAY DETECTOR

Jack D. Kingsley, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,146
Int. Cl.² G01T 1/20
U.S. Cl. 250—367 **15 Claims**



1. A detector for x-ray flux, comprising:

scintillator means for converting quanta of x-rays indident thereon to optical fluorescence quanta and including a scintillator member having a generally rectangular parallelopiped shape with at least one lateral side surface;

photosensor means adjacent the scintillator means for detecting the optical fluorescense quanta;

a pair of plates each extending forward of, and substantially perpendicular to, a front surface of said scintillator member and generally toward the source of said x-ray flux for collimating the x-ray flux impingent upon said scintillator means; and

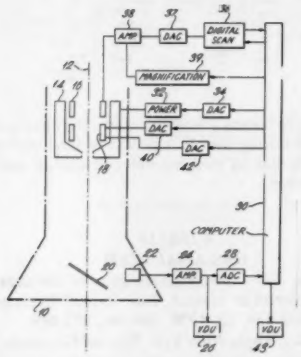
means cooperating with said collimating means and positioned to shadow said lateral side surface of said scintillator member for substantially preventing impingement of x-ray quanta upon at least said lateral side surface of said scintillator member.

4,180,738

ASTIGMATISM IN ELECTRON BEAM PROBE INSTRUMENTS

Kenneth C. A. Smith, Cambridge, and William J. Tee, Bishops Stortford, both of England, assignors to National Research Development Corporation, London, England

Filed Jul. 27, 1978, Ser. No. 928,620
Claims priority, application United Kingdom, Jul. 30, 1977, 32084/77
Int. Cl.² G21K 1/08
U.S. Cl. 250—396 ML **10 Claims**



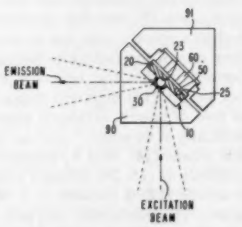
1. In an electron beam probe instrument a method for investigating and correcting astigmatism comprising a sequence of automatic operations, namely: scanning an array of points on a specimen; setting the excitation of the objective lens to enable a focused image of the specimen to be produced; resetting the lens excitation in turn to a first value below the setting for focus and to a second value above the setting for focus; determining for the first and second values of lens excitation the directional derivatives of intensity in a plurality of directions for each point of the array; deriving the difference between the respective sums for all points of the array of the derivative in each direction, for the first value of excitation and the derivative in each corresponding direction for the second value of excitation; determining the sum of such differences, the sum, denoted by S, being a measure of the astigmatism; and operating astigmatism compensation means to minimise the value of S.

4,180,739

THERMOSTATABLE FLOW CELL FOR FLUORESCENCE MEASUREMENTS

Ahmad Abu-Shumays, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 23, 1977, Ser. No. 864,137
Int. Cl.² G01N 21/38
U.S. Cl. 250—461 R **12 Claims**



1. A flow cell assembly for fluorescence measurements, including means for obtaining temperature equilibration of a

liquid sample in less than 15 seconds, including cavity forming means having a volume less than 20 microliters for containing a fluid sample to be analyzed, said cavity forming means comprising a first wall portion that is metallic and a second wall portion that is transparent to electromagnetic radiation, said first wall portion comprising a surface region on a metallic block, said second wall portion being affixed to said metallic block, said second wall portion being of a size sufficient to enable entry of a flux of exciting radiation into said cavity and observation of fluorescence emissions caused in said fluid sample by said exciting radiation;

a temperature sensing means affixed to said metallic block; and

means responsive to said temperature sensing means for driving a thermoelectric device so as to maintain, in operation, the temperature of said sample within said cavity at a desired value.

4,180,740

X-RAY INTENSIFYING SCREENS

André R. Suys, Hove, and Willy K. Van Landeghem, Sint-Gillis-Waas, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jun. 30, 1978, Ser. No. 920,665

Claims priority, application United Kingdom, Jul. 20, 1977, 30497/77; Belgium, Aug. 31, 1977, 56201

Int. Cl.² G01M *21/38*

U.S. Cl. 250—483 **9 Claims**

1. An X-ray image intensifying screen comprising in dispersed form in a binder layer:

(1) halide-containing phosphor particles that are admixed, combined in contact with, or have reacted with one or more organic substances being capable of reacting with hydrogen chloride and/or with labile halogen, whereby the fluorescence power of said particles is less prone to be reduced by moisture, and

(2) non-hygroscopic halide-free phosphor particles in such a ratio by weight of (1) to (2) that the ratio of the intensification factor of said screen to that of an identical screen containing, however, no non-hygroscopic phosphor particles (2) is not smaller than 1:4.

4,180,741

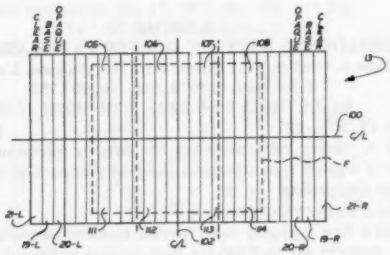
APPARATUS FOR DETERMINING IMAGE AREAS FOR PRINTING WITH CALIBRATION

Roland T. Palmatier, Westerly, R.I.; Barry P. Green, Waterford, Conn.; Leonard R. Reinhart, Melbourne Beach, Fla.; Francis J. Sciulli, and Jon E. Holmes, both of Palm Bay, Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Jun. 7, 1978, Ser. No. 913,465

Int. Cl.² G01N *21/30*

U.S. Cl. 250—559 **9 Claims**



1. Apparatus for determining the relative image area in each column of an image member divided into ink key columns corresponding to those in which ink is controlled in a printing cylinder comprising support means divisible into ink key columns for supporting said image member at positions thereon corresponding to the column positions on said printing cylinder at which the image on said image member is to be printed, light source means for directing light on said columns of said support means, means for sensing light from said columns and providing signals indicating the amount of light received, means on said support means defining a fully imaged area and an unimaged area of said image member, means for obtaining data representative of light from said unimaged area, said fully imaged area and said image member, and means for utilizing said data from said unimaged and said fully imaged areas to calibrate and normalize said data from said image member.

4,180,742

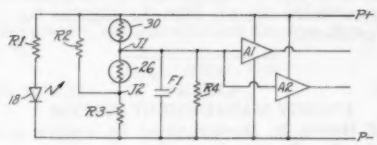
DETECTOR WITH SUPERVISORY SIGNAL FROM MONITOR CELL

William J. Malinowski, Pembroke, Mass., assignor to Chloride Incorporated, Tampa, Fla.

Filed Mar. 27, 1978, Ser. No. 890,064

Int. Cl.² G01N *21/26*

U.S. Cl. 250—574 **6 Claims**



1. A detector for providing a signal when a medium to be detected reaches a predetermined concentration, comprising a light source, a first photo-resistive device positioned to receive substantially only light from the light source reflected from the medium, a second photo-resistive device positioned to receive light directly from the light source, power leads and a signal lead, said first and second photo-resistive device being connected in series through a first junction, said second photo-resistive devices being connected in series through a second junction with a resistor, the photo-resistive devices and the resistor being connected across the power leads, the signal lead being connected to the first junction, and means maintaining said second junction at a voltage which is a predetermined percentage of the power lead voltage, whereby a stand-by voltage appears at the first junction when said second photo-resistive device is illuminated the electrical characteristics of the components being such that said stand-by voltage is appreciably different in value from the voltage appearing at the first junction when the first photo-resistive device is exposed to light reflected from the medium at said predetermined concentration.

4,180,743

INERTIA-ACTUATED STARTER FOR AN EXPLOSION ENGINE

Bernard Lacroix, Montbeliard, France, assignor to Cycles Peugeot, Valentigney, France

Filed May 8, 1978, Ser. No. 904,118

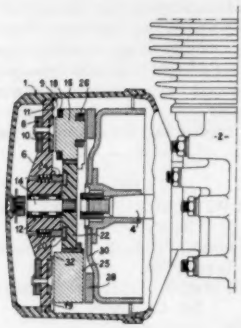
Claims priority, application France, May 12, 1977, 77 14543

Int. Cl.² H02K *7/00*

U.S. Cl. 290—38 B **6 Claims**

1. An inertia-actuated starter for starting an engine having a crankshaft, the starter comprising an electric motor having an armature and an inductor, a flywheel connected to be rotated by the electric motor, an electromagnetic clutch including an armature and an inductor for rendering the flywheel rigid with said crankshaft, the flywheel carrying on one side thereof the armature of the motor and on an opposite side thereof the inductor of the clutch, a flat disc parallel to the flywheel and carrying the inductor of the motor and defining a planar airgap of the motor, and the flywheel comprising a part which is common to the magnetic circuit of the armature of the motor and of the inductor of the clutch which has sufficient section to

permit the circulation of the magnetic flux of the motor or of the clutch but which is saturated by the circulation of the flux



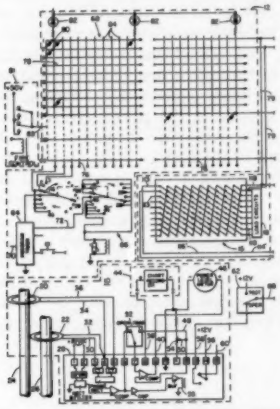
of the motor so that a remanent flux of the clutch will be cancelled out instantaneously when the magnetic flux of the motor is produced.

4,180,744

ENERGY MANAGEMENT SYSTEM

William F. Helwig, Jr., Downers Grove, Ill., assignor to Avtec Industries, Inc., Downers Grove, Ill.

Filed Aug. 8, 1977, Ser. No. 822,543
Int. Cl.[2] H02J *3/14*
U.S. Cl. 307—39 **22 Claims**



1. An energy management system for limiting continuously instantaneous permissible power levels of a plurality of controllable loads on a non-priority basis comprising:

transducer means for continuously measuring instantaneous power demands of a plurality of controllable loads;

means for pre-setting an instantaneous permissible power level;

means for generating an output signal when the measured power demand exceeds the pre-set power level;

means responsive to the output signal to disconnect a sufficient number of said plurality of controllable loads in a sequential pre-determined order from an initial load to be disconnected until the measured instantaneous power demand is reduced below the pre-set permissible power level;

switching means responsive to the output signal to select the initial load to be disconnected and to randomly vary the initial load of the plurality of controllable loads that is to be selected and disconnected;

said switching means having a plurality of stationary contacts each of which is coupled to one of said plurality of controllable loads and a movable contact coupled to the output signal and movable relative to the plurality of contacts at a pre-determined rate to contact said plurality of contacts in the sequential pre-determined order; and

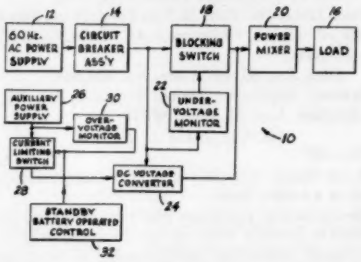
said initial load to be disconnected being dependent on the position of said movable contact with respect to one of said stationary contacts.

4,180,745

POWER REGULATING SUPPLY SYSTEM FOR AC ELECTRICAL LOADS

Frank Bartlett, 4815 E. Platte, Colorado Springs, Colo. 80916, and Allen R. Franks, P.O. Box 1552, Rockport, Tex. 78382

Filed Oct. 19, 1977, Ser. No. 843,572
Int. Cl.[2] H02J *3/46*
U.S. Cl. 307—45 **9 Claims**



1. In combination with an AC power network adapted to apply AC line voltage to an AC load substantially at rated current and frequency, and an auxiliary power source independent of said AC power network from which a DC voltage is obtained, a power control system comprising converting means connected to the auxiliary power source for converting the DC voltage from the auxiliary source into a pulsating voltage at said rated frequency and in phase with the line voltage, power mixing means operatively coupling the AC power network and the converting means to the AC load for operation thereof by either or both of said AC line and pulsating voltages under rated conditions, switch means connecting the auxiliary power source to the converting means for supply of current thereto in a signal controlled mode of operation of the converting means, sensing means connected to the auxiliary power source for detecting an overvoltage condition of the DC voltage, and gate means connecting the sensing means to the switch means for opening thereof in response to said detection of the over-voltage condition.

4,180,746

INTERLOCKED BATTERY JUMPER CABLE ASSEMBLY

William E. Giuffra, 1111 Buena Vista Dr., Jackson, Calif. 95642

Filed Nov. 6, 1978, Ser. No. 957,752
Int. Cl.[2] H02J *7/34;* **H01R** *3/02;* **H02H** *11/00*
U.S. Cl. 307—127 **10 Claims**

1. A jumper cable assembly for directly interconnecting a pair of a given type storage battery only in parallel with each other comprising:

(a) a support member;

(b) a first normally open switch element mounted on said support member having first, second and third electrical terminals and responsive to the normal voltage of said given type of storage battery when applied between said first and third electrical terminals to interconnect said first and second electrical terminals;

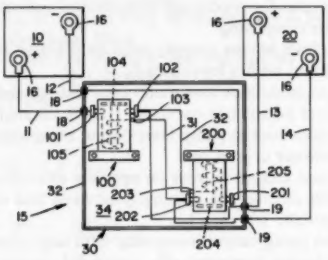
(c) a second normally open switch element mounted on said support member having first, second and third electrical terminals and responsive to the normal voltage of said

given type of storage battery when applied between said first and third electrical terminals to interconnect said first and second electrical terminals;

(d) electrically conductive means electrically interconnecting said second electrical terminal of said first switch element and said third electrical terminal of said second switch element;

(e) electrically conductive means electrically interconnecting said second electrical terminal of said second switch element and said third electrical terminal of said first switch element;

(f) first and second lengths of jumper cable mounted with respect to said support member to define a pair with one end of each of said first and second lengths of jumper cable having means thereon for making removable electrical connection to a pole of a battery of said given type, the other end of said first length of jumper cable being electrically connected to said first electrical terminal of said first switch element and the other end of said second length of jumper cable being electrically connected to said first electrical terminal of said second switch element; and



(g) third and fourth lengths of jumper cable mounted with respect to said support member to define a pair with one end of each of said third and fourth lengths of jumper cable having means thereon for making removable electrical connection to a pole of a battery of said given type, the other end of said third length of jumper cable being electrically connected to said second electrical terminal of said first switch element and the other end of said fourth length of jumper cable being electrically connected to said second electrical terminal of said second switch element.

4,180,747

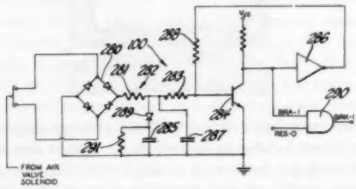
SWITCHING CIRCUIT FOR ELIMINATING THE EFFECTS OF CONTACT BOUNCE

John F. Zettler, Stow, Mass., assignor to Xenex Corporation, Birmingham, Mich.

Division of Ser. No. 724,059, Sep. 16, 1976, Pat. No. 4,048,886. This application Jul. 11, 1977, Ser. No. 814,508

Int. Cl.[2] A03K *17/26*; H03K *17/56*

U.S. Cl. 307—247 A **3 Claims**



1. In a control circuit, a movable contact switch for applying a control voltage to a signal generating circuit, said switch being adapted for connection with a voltage source whereby the control voltage is alternately positive going and negative going upon actuation of the switch between open and closed positions, said movable contact switch being subject to contact bounce whereby a momentary voltage pulse is produced upon closure of said contacts, said signal generating circuit including a transistor switch having an input for control thereof and having an output for producing an output signal which is in a first or second state according to the voltage applied to the input, coupling means connected between said movable contact switch and the input of the transistor switch and including a time constant circuit having a different value of time constant for a positive going control voltage than for a negative going control voltage, the time constant being greater for a control voltage of the same polarity as said momentary pulse whereby said transistor switch is prevented from responding to said momentary pulse.

4,180,748

ELECTRONIC SOLID STATE SWITCHING DEVICE

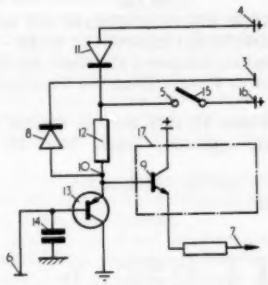
Eric J. Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

Filed Oct. 21, 1977, Ser. No. 844,466

Claims priority, application United Kingdom, Nov. 10, 1976, 46865/76

Int. Cl.[2] H03K *17/74*

U.S. Cl. 307—253 **5 Claims**



1. A solid state switching circuit comprising in combination, a diode, an output transistor with base and collector and emitter, a signal path input terminal directly connected at a junction to the base of said transistor through the diode, an ouput terminal of the switching circuit connected to the emitter of said transistor, and a solid state device connected for selectively controlling the potential of the connection junction between the diode and the transistor in an operating mode to render both the diode and the transistor simultaneously either conductive or non-conductive, with the switching circuit exhibiting a very high off impedance to the input circuit means by serial connection solely through said diode and the transistor base impedance, and a very low on impedance to the transistor base when the diode is conducting.

4,180,749

INPUT BUFFER FOR INTEGRATED INJECTION LOGIC CIRCUITS

Benjamin J. Sloan, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

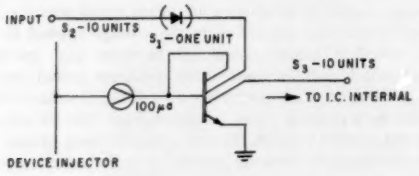
Filed Jul. 18, 1977, Ser. No. 816,408

Int. Cl.[2] H03K *19/08*

U.S. Cl. 307—299 B **7 Claims**

1. A circuit for achieving compatibility between first and second systems operating at different voltage levels, comprising an inverted multiple-collector transistor wherein a first collector thereof is electrically common with the base thereof, a second collector including a Schottky barrier is connected to

receive a relatively high-voltage signal from said first system, and a third collector is connected as the input to a second



system and provides a lower-voltage signal compatible with said second system.

4,180,750

TRANSISTOR SWITCHING CIRCUIT WITH SHORTI``ED RESPONSE TIME

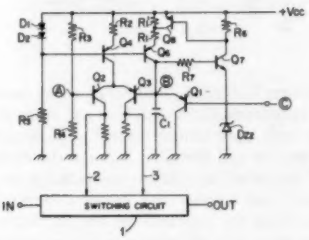
Akio Ozawa; Masaharu Sakamoto, and Hideo Ito, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,701

Claims priority, application Japan, Mar. 15, 1977, 52-13017[U]

Int. Cl.² H03K 5/153

U.S. Cl. 307—362 **5 Claims**



1. In a transistor switching circuit including first switching means comprising at least one switching transistor, a capacitor having a first terminal connected to the base of said transistor and a second terminal connected to ground, a first source of constant current for charging said capacitor, and second switching means for controlling the application of said charging current to said capacitor, whereby the conduction state of said transistor is reversed when the potential on said capacitor reaches a first threshold level, the improvement characterized by:

(a) third switching means for controlling said first constant current source, comprising:

means for providing a second threshold level lower than said first threshold level;

means connected between the means for providing the second threshold level and said capacitor for comparing the potential on said capacitor with the second threshold level; and

means actuated by the comparing means for increasing the magnitude of said charging current when the charge on said capacitor reaches said second threshold level.

4,180,751

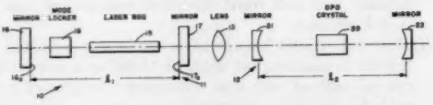
MODE-LOCKED OPTICAL PARAMETRIC OSCILLATOR APPARATUS

Eugene O. Ammann, Los Altos, Calif., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 8, 1978, Ser. No. 940,530

Int. Cl.² H03F 7/00

U.S. Cl. 307—428 **9 Claims**



1. Apparatus for producing mode-locked optical parametric oscillations comprising

a pump laser having a cavity with an effective length l_p and an output with a frequency f_p,

means to mode lock said pump laser output, and

an optical parametric oscillator (OPO) adapted to receive the mode-locked pump laser output comprising

a nonlinear crystal, and

first and second mirrors on opposite sides of said crystal with an effective spacing l_o between said mirrors substantially less than l_p,

said pump output interacting with said crystal for producing parametrically generated outputs having a signal frequency (f_s) and an idler frequency (f_i) which satisfy the relationship

$$f_p = f_s + f_i$$

said mirrors being highly reflective at the frequency of one of said crystal outputs and being highly transmissive at said pump output frequency and at the frequency of the other of said crystal outputs.

4,180,752

MAGNETOHYDRODYNAMIC DEVICE

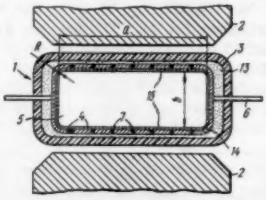
Samuil M. Gorlin; Grigory A. Ljubimov; Valentin A. Bitjurin; Valentin I. Kovbasjuk; Vladilen I. Maximenko; Stanislav A. Medin, and Alexandr E. Barshak, all of Moscow, U.S.S.R., assignors to Institut Vysokikh Temperatur Akademii Nauk SSSR, Moscow

Filed Dec. 28, 1977, Ser. No. 865,340

Claims priority, application U.S.S.R., Dec. 29, 1976, 2435698

Int. Cl.² H02N 4/02

U.S. Cl. 310—11 **1 Claim**



1. A magnetohydrodynamic device, comprising: a magnetic system; a duct located in said magnetic system and adapted for a conducting gas to flow at an angle with the direction of the induction vector of said magnetic field; a plurality of electrodes electrically interacting with said gas; a cross-sectional shape of the working space of said duct bounded by a convex curve inscribed into a rectangle with its sides $a \leqq b$; a minimum radius R of curvature of said curve being related to a distance 'x' from entry of said duct to the cross-section under consideration by the following formula:

$$\frac{a}{2} > R \geqq 5\,(10^{-2} \text{ to } 10^{-4}) \cdot \left[1 + \frac{P_o}{4S_o}\, x\right]^{\alpha} \frac{4S_o}{P_o},$$

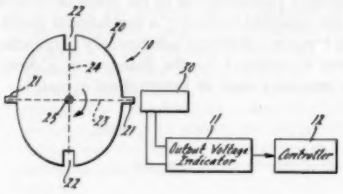
where P_o and S_o stand, respectively, for the perimeter and cross-sectional area of the duct at the entry thereof and $0.5 \leqq \alpha \leqq 1$.

4,180,753

APPARATUS FOR GENERATING ELECTRICALLY DISTINGUISHABLE BIPOLAR SIGNALS USING A MAGNETIC SENSOR AND AN OVAL WHEEL WITH TEETH AND NOTCHES IN ITS MINOR AND MAJOR AXIS

James C. Cook, II, Lincoln Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 30, 1978, Ser. No. 920,762
Int. Cl.[2] H02K *21/26*
U.S. Cl. 310—168 **6 Claims**



1. Pulse generating means for providing electrically distinguishable signals, said signals occurring as a function of position of a relatively movable element, said pulse generating means comprising:

a transducer means located on said relatively movable element for generating the electrically distinguishable signals;

a transducer receiving means located in energy transfer coupling with respect to said transducer means for providing the electrically distinguishable signals in response to passage of said transducer means past said transducer receiving means;

said transducer means including teeth means for projecting toward said transducer receiving means for generating an electrical signal of a first shape and notch means for receding away from said transducer receiving means for generating an electrical signal of a second shape, distinguishable from said first shape, each of said teeth means and notch means being sufficiently sized to be detected by said transducer receiving means;

said transducer means including a generally oval disc of a magnetic material having a major and a minor diameter, said projections for said teeth means extending outward from said disc along said minor diameter, said notch for said notch means extending radially inward along said major diameter, said notch and said projection having a generally rectangular shape and the periphery of said oval between an adjacent pair of notch means and teeth means being a continuous curve; and including two teeth, one tooth being opposite from the other, and further including two notches, one notch being opposite from the other notch and each notch being positioned midway around the circumference of said oval between said two teeth; and

said transducer receiving means including a permanent magnet, an electrical pickup means coupled to said magnet for detecting changes in the magnetic flux, and said magnet being sufficiently close to a path of rotation for said teeth means and said notch means that movement of said teeth means and said notch means past said transducer receiver means causes a change of magnetic flux within pickup means

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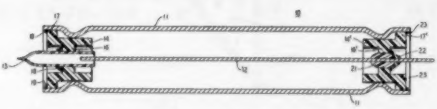
4,180,754

GEIGER-MUELLER TUBE WITH A RE-ENTRANT INSULATOR AT OPPOSING SEALED ENDS THEREOF

Stephen Levy, Monmouth County, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 883,552
Int. Cl.[2] H01J *17/04, 17/18, 5/20*
U.S. Cl. 313—93 **5 Claims**



1. A Geiger-Mueller tube within which a geiger discharge is produced comprising:

a tubular cylindrical cathode,

an elongated metal anode coaxially disposed within said cathode along the longitudinal axis of said cathode,

a gaseous medium disposed in the space between said cathode and said anode,

a dielectric support member at each end of said cathode, each including an axially extending tubular body portion, a first projecting portion adjacent one end of said body portion and extending radially outward from said body portion and a second projecting portion extending radially inward from said body portion and spaced from the end of said body portion remote from said first projecting portion,

first dielectric sealing means for sealing said first projecting portion of said member to said cathode adjacent the corresponding end of said cathode,

the other ends of each of said members removed from said corresponding first projecting portion forming a longitudinal boundary of the geiger discharge region of the tube,

second dielectric sealing means for sealing said second projecting portion of one of said members to a region of said anode juxtaposed to said second projecting portion which is disposed outside the longitudinal boundaries of said geiger discharge region,

the outer surface of each of said body portions in the region of said longitudinal boundary being spaced from said cathode to shield the geiger discharge from distorted electric fields occurring at the interface of the corresponding first projecting portion and said cathode, and

the inner surface of the body portion of said one member in the region of said longitudinal boundary defined by said other end of said one member being spaced from said anode to shield the geiger discharge from the distorted electric field occurring at the interfaces of said second dielectric sealing means and said anode.

4,180,755

SEALED BEAM LAMP INCLUDING FILAMENT LOCATING MEANS

Roy A. Nixon, Jr., Greenville, Ohio, assignor to Corning Glass Works, Corning, N.Y.

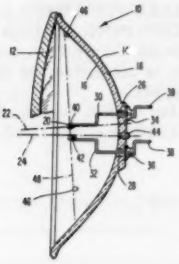
Division of Ser. No. 749,450, Dec. 10, 1976, Pat. No. 4,125,890. This application Sep. 15, 1978, Ser. No. 942,602
Int. Cl.[2] H01K *1/18, 1/32*
U.S. Cl. 313—113 **6 Claims**

1. A sealed beam incandescent lamp, comprising:

a lens member for refracting a beam of light emanating from within the lamp;

a generally concave reflector member attached to said lens member to form a lamp envelope, said reflector member exhibiting a substantially parabolic transverse section;

a filament assembly fixedly attached to said reflector member, and including a filament member disposed approximately in the latus rectum of the parabola; and



at least three discrete bosses formed in the inner surface of said reflector member, said bosses defining a plane substantially perpendicular to the axis of said parabola such that said bosses enable the accurate mounting of the filament at the latus rectum of the lamp.

4,180,756

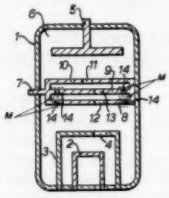
THYRATRONS

Robert J. Wheldon, Chelmsford, and Christopher V. Neale, Hatfield Peverel, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Jul. 10, 1978, Ser. No. 923,349

Int. Cl.[2] H01J *61/00*

U.S. Cl. 313—193 **8 Claims**



1. A gas filled thyratron for switching the current in a discharge circuit, said thyratron having a thermionic cathode and an anode and, therebetween, at least one grid which in operation may be grounded, said grid comprising at least three electrically and mechanically united apertured baffle electrodes occurring in sequence in the thermionic cathode-to-anode path of the thyratron, the baffle electrodes on the cathode side of the final baffle electrode forming at least one reentrant hollow non-thermionic cathode which is capable of conducting the full discharge current without degradation, the discharge current path being short and of low impedance.

4,180,757

INCANDESCENT LAMP WITH VIBRATION-PROTECTED FILAMENT MOUNT

Jack E. Distler, Indianapolis, Ind.; Albert A. Hamilton, Belton, Mo., and Everett R. King, Fort Lauderdale, Fla., assignors to Western Electric Co., Inc. and Bell Laboratories, Inc., both of New York, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,392

Int. Cl.[2] H01K *1/14*

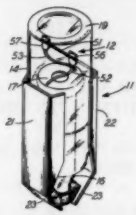
U.S. Cl. 313—315 **4 Claims**

1. An incandescent lamp comprising:

an envelope having a substantially cylindrical center portion, a base at one end of the center portion and a lens at the other end thereof;

a pair of terminals, each terminal having a contact surface located opposite the other on the outer surface of the center portion, adjacent the base and centered on a plane including the cylindrical axis of the center portion;

a pair of posts spaced from each other and mounted in the base, each post being adjacent one of the terminals, each of the posts being electrically coupled to its adjacent terminal, the posts extending within the envelope from the base toward the lens, the posts being skewed with respect to the cylindrical axis; and



a filament spanning a gap between the two posts in a direction substantially perpendicular to the plane on which the terminals are centered, whereby a mechanical shock applied to the lamp in a direction substantially perpendicular to the plane is received by the filament in a direction coinciding generally with its longitudinal extent.

4,180,758

CAPLESS ELECTRIC INCANDESCENT LAMP

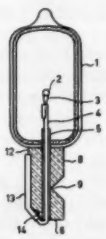
Victor R. Notelteirs, and Josephus F. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,953

Claims priority, application Netherlands, Oct. 1, 1976, 7610860

Int. Cl.[2] H01J *5/48*

U.S. Cl. 313—318 **5 Claims**



1. A capless electric incandescent lamp having: a light-pervious lamp envelope sealed by means of a flat pinch having first and second opposed major faces, a filament disposed in said envelope, two current supply conductors connected to said filament extending through said flat pinch and emanating from said lamp envelope at the end of said pinch remote from said envelope, said conductors being bent backwards along the surface of said first major face of said pinch in the direction of said filament, said first major face being provided with means for preventing contact between the portions of said current supply conductors extending along said first major face, said second major face of said pinch having position fixing means for cooperating with a fixing member in a lampholder, said position fixing means comprising a V-shaped groove extending across said second major face.

4,180,759

THERMAL CAMERA TUBES

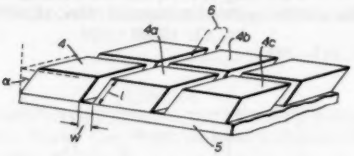
Jeffrey J. Harris, Colchester, and Brian W. Rampling, Maldon, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 21, 1977, Ser. No. 844,179

Claims priority, application United Kingdom, Aug. 20, 1977, 35045/77

Int. Cl.[2] H01J *29/45*

U.S. Cl. 313—388 8 Claims



1. A pyroelectric target plate for a thermal camera tube comprising, in combination:

a supporting layer of low thermal conductivity; and

an array of pyroelectric target elements on one surface of said supporting layer, said elements being disposed in regularly spaced relation in a plurality of columns and a plurality of rows thereof whereby to define channels between the elements, at least a majority of said elements completely overhanging channels adjacent thereto, thereby tending to restore the reduction in responsivity which would otherwise be experienced by virtue of there being no pyroelectric material within the channels themselves.

4,180,760

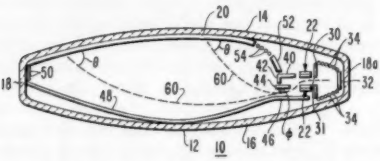
FLAT CATHODE RAY TUBE HAVING MAGNETICALLY COLLIMATED ELECTRON BEAM DEVICE

Kern K. N. Chang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,230

Int. Cl.[2] H01J *31/08*

U.S. Cl. 313—422 8 Claims



1. An image display device comprising:

an evacuated envelope having front and rear walls and a plurality of side walls between the front and rear walls;

a cathodoluminescent screen on the front wall;

a magnet structure extending longitudinally along and spaced from one side wall and having two poles spaced from one another, the magnet structure generating a uniform magnetic field between the two poles;

an electron gun for generating and directing an electron beam into the space between the one side wall and the magnet structure;

a first deflection means for deflecting said electron beam in a substantially parabolic trajectory so that it will pass between the poles of the magnet structure at various points along the magnet's length while maintaining a constant angle of incidence at which the electron beam enters the space between the magnet poles; and

a second deflection means for deflecting the electron beam toward the screen in a substantially parabolic trajectory after it passes between the poles of the magnet structure so that the beam impinges upon the screen at a substantially constant angle of incidence.

4,180,761

CONTROL DEVICE, PARTICULARLY FOR CONTROLLING THE EMISSION CURRENT OF AN X-RAY TUBE

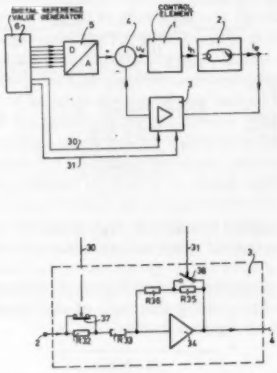
Rudolf Ochmann, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,935

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2613997

Int. Cl.[2] G05F *1/00*; H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—292 14 Claims



1. A control device for controlling the emission current of an X-ray tube comprising, a digital reference value generator having a plurality of binary positions, a digital-to-analog converter having an input coupled to receive a digital value signal supplied by the reference value generator and an output at which a corresponding analog reference value signal is produced, only a part of the binary positions of the digital reference value generator being coupled to the input of the digital-to-analog converter, a comparison device for comparing the analog reference value signal with a signal representing the actual value of the emission current and for controlling, in the event of a deviation therebetween, the emission current so as to reduce the deviation, an amplifier circuit for amplifying at least one of the compared signals, and means coupling the remainder of the binary positions of the digital reference value generator to a control input of the amplifier circuit to control the amplification thereof so that if the emission current increases, the quotient of the reference value signal and the actual value signal at the input of the comparison device is step-wise is to be increased.

4,180,762

DRIVER CIRCUITRY FOR PLASMA DISPLAY PANEL

Larry F. Weber, Urbana, Ill., assignor to Interstate Electronics Corp., Anaheim, Calif.

Filed May 5, 1978, Ser. No. 903,126

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169.4 13 Claims

1. A sustainer drive system for an AC plasma panel, said panel having plural electrodes respectively forming the X and Y axes thereof, said drive system comprising:

means for supplying a sustainer waveform across the panel comprising a single sustainer circuit;

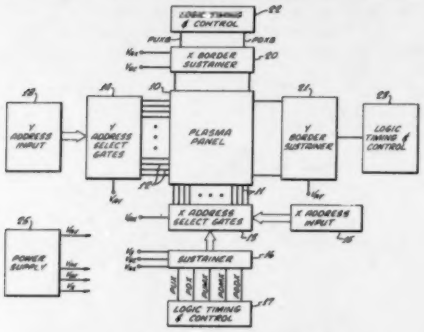
means for coupling said single sustainer circuit to those panel electrodes which form only one of said axes;

said single sustainer circuit including:

an NPN pull-high output transistor connected in series

with an NPN pull-down output transistor between a high voltage and ground, with the sustainer drive signal being produced at the node common to both transistors, the base of said pull-high transistor floating up and down at a high voltage close to the panel voltage;

low voltage base drive circuits coupled to, but isolated from said NPN pull-high and pull-low output transistors by respective first and second isolating capacitors;



means coupled to said pull-high transistor for preventing ringing thereof when said transistor is turned on and off; and

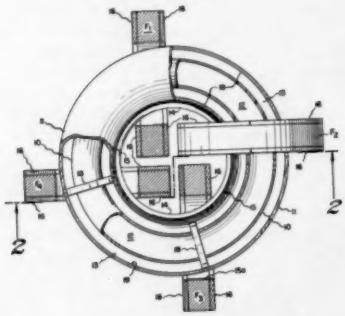
means coupled to said pull-high and pull-low output transistors for insuring that both of said transistors are not driven on simultaneously.

4,180,763

HIGH INTENSITY DISCHARGE LAMP GEOMETRIES

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 25, 1978, Ser. No. 872,153
Int. Cl.[2] H05B *41/16, 41/24*
U.S. Cl. 315—248 **39 Claims**



1. A high intensity discharge, solenoidal electric field lamp comprising:

an inner toroidal shaped discharge tube containing a suitable ionizable gaseous medium which emits visible wavelength radiation when a current traverses said ionizable medium, said medium being at a pressure of between approximately 200 torr and approximately one atmosphere;

an outer toroidal shaped transparent protective tube wholly surrounding said discharge tube;

means for centrally spacing said inner discharge tube within said outer protective tube, so that the surfaces of neither come in contact;

a plurality of toroidal shaped ferrite cores disposed in a substantially regular manner circumferentially about the inner discharge tube and the outer protective tube in the form of interlocking rings; and

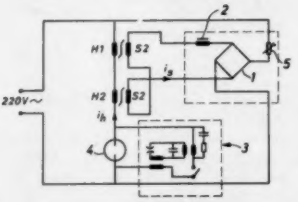
means to couple the ferrite cores to a radio frequency power source.

4,180,764

CONTROL CIRCUIT FOR AN A.C. DISCHARGE LAMP

Poul Mørup, Vaerløse, Denmark, assignor to Alex Grosman A/S, Herlev, Denmark

Filed May 8, 1978, Ser. No. 903,883
Claims priority, application Denmark, Nov. 16, 1977, 5084/77
Int. Cl.[2] H05B *41/36*
U.S. Cl. 315—283 **3 Claims**



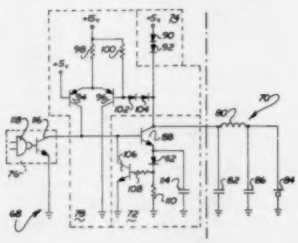
1. A control circuit for an A.C. discharge lamp (4) comprising a series transductor having control windings (S1, S2) coupled between the A.C. source and the lamp (4), the control windings (S1, S2) of the series transductor being connected to the A.C. source through a filter (2) and a full-wave rectifier (1), and a substantially capacitive variable impedance (5) in the control winding circuit.

4,180,765

HIGH SPEED DEFLECTION YOKE DRIVER CIRCUIT

Charles M. White, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed May 24, 1978, Ser. No. 909,219
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—408 **8 Claims**



1. Apparatus comprising:

current switching means controllable to limit the level of current passing therethrough;

clamping means for preventing saturation of said current switching means by preventing the voltage across said current switching means from dropping below a fixed limiting voltage level, greater than the saturation voltage of said current switching means;

means for causing said current switching means to switch between a first state, wherein substantially no current flows through said current switching means, and a second state, wherein a controlled current flow passes through said current switching means and the voltage across said current switching means is at said limiting voltage level;

circuit means coupled to said current switching means such that the operation of said current switching means influences the operation of said circuit means; and

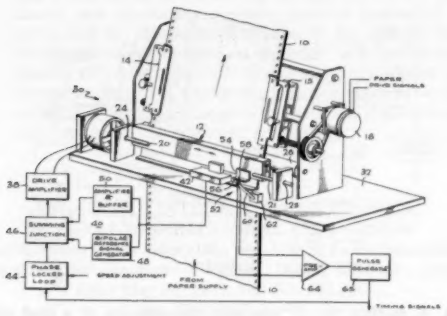
means for controlling said current switching means so as to control the current flow therethrough when said current switching means is in said second state, to limit current flow through said clamping means so that said current flow through said clamping means does not exceed a limiting current level, independently of variations in the amount of current passing between said circuit means and said current switching means, wherein said limiting current level is selected to be substantially smaller than the maximum current level which is expected will pass between said circuit means and said current switching means.

4,180,766

RECIPROCATING LINEAR DRIVE MECHANISM

Jerry Matula, Culver City, Calif., assignor to Printronix, Inc., Irvine, Calif.

Filed Feb. 4, 1977, Ser. No. 765,873
Int. Cl.[2] H02K *33/00*
U.S. Cl. 318—128 **3 Claims**



1. A reciprocating linear drive mechanism comprising:
reciprocable means;
linear magnetic actuator means coupled to said reciprocable means;
resilient means defining opposite limit positions along the travel of the reciprocable means and operative to be impacted by the reciprocable means to reverse the direction thereof at each of the opposite limit positions and to cause the reciprocable means to rebound from the resilient means;
means coupled to said linear actuator means for controlling the velocity of said reciprocable means between the limit positions, said means including means responsive to each rebounding of the reciprocable means from the resilient means for providing an energizing signal to the linear magnetic actuator means to insure to and maintenance of the reciprocable means at a desired velocity, a tachometer for generating a signal representing the velocity of the reciprocable means, means for providing a reference signal representing desired velocity of the reciprocable means, and means for energizing the magnetic actuator in accordance with any difference between the signal representing the velocity of the reciprocable means and the reference signal; and
means responsive to the reciprocable means for generating pulses in response to increments of movement of the reciprocable means;
the means for providing a reference signal including means for providing a clocking signal of selected frequency and means responsive to the generated pulses and to the clocking signal for generating a signal representing the difference in frequency between the generated pulses and the clocking signal.

4,180,767

CLOSED-LOOP REGULATING AND OVERHAULING LOAD ENERGY DISSIPATING CHOPPER TYPE CURRENT CONTROL SYSTEM FOR D.C. MOTORS

Robert L. Risberg, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Continuation of Ser. No. 877,923, Nov. 10, 1969, abandoned, which is a continuation of Ser. No. 637,530, May 10, 1967, abandoned. This application Jul. 29, 1971, Ser. No. 167,453
Int. Cl.[2] H02P *5/00*
U.S. Cl. 318—308 **11 Claims**

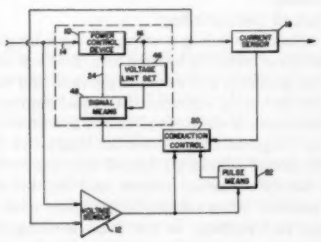
1. The combination with a rectifier A.C. to D.C. supply source having high and low potential D.C. output buses, a D.C. motor, a tapped inductor, a pair of controlled electronic devices having their main conducting paths connected respectively between the opposite ends of said inductor and said output buses and arranged to afford current flow from high to low potential, a second inductor connected from the tap of said tapped inductor in series with the armature of said motor to the low potential bus, pairs of parallel connected capacitors and diodes connected between the tap of said tapped inductor and said buses with the diodes poled for current flow opposite to that of said electronic devices and means in circuit with said electronic devices for effecting alternate conduction of the latter, of energy absorbing means in circuit with the motor armature circuit and control means responsive to a predetermined increase in the potential between said buses during overhauling motor operation to bypass motor armature current through said energy absorbing means until the electronic device connected to the low potential bus is thereafter rendered conducting.

4,180,768

ENERGY LIMITING FOLDBACK CIRCUIT FOR POWER SUPPLY

Angelo Ferraro, Ballston Lake, N.Y., assignor to Tele/-Resources, Incorporated, Armonk, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,504
Int. Cl.[2] G05F *1/58*
U.S. Cl. 323—9 **6 Claims**



1. An energy limiting foldback circuit for a power supply having a power control device in the output thereof, the energy limiting foldback circuit comprising:
(a) voltage sensing means for sensing the potential drop between the input and output of the power control device,
(b) current sensing means for sensing the current through the power control device,
(c) conduction control means responsive to predetermined combined range of output levels of the voltage sensing means and the current sensing means for controlling the operating conduction through the power control device whereby controlled conduction is permitted during a threshold range of said output levels and zero conduction is achieved when said output levels exceed said threshold range, and
(d) timing control means associated with said voltage sensing means and said conduction control means for allowing an excessive voltage condition to exist across the power

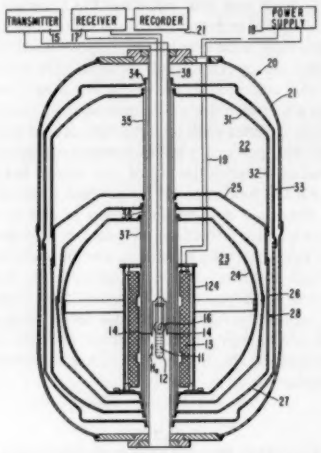
control device for a predetermined amount of time before said conduction control means becomes operative.

4,180,769

SUPERCONDUCTING SOLENOID WITH COMPENSATION FOR AXIAL GRADIENTS

Robert E. Gang, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 21, 1978, Ser. No. 879,298
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—319 **14 Claims**



1. A superconducting solenoid coil having compensation for axial gradients of orders 1–7 comprising

a superconducting wire, said wire being wound as a solenoid having a longitudinal axis and multiple helical layers, adjacent ones of said layers having faces that substantially abut against each other, and being pitched in opposite directions,

said solenoid coil including:

a main solenoid winding portion having a longitudinal axis, a transverse centrally located axis, first and second opposite end portions, and a central portion, said main winding portion including a substantially equal number of turns on opposite sides of the transverse axis and producing a longitudinal magnetic field within the interior of the solenoid,

first and second auxiliary solenoid winding portions coaxial with the main winding portion, said first and second auxiliary portions being substantially aligned with the first and second end portions of the main winding portion, said auxiliary winding portions being wound, connected and positioned to increase the magnetic field of the main winding portion in the vicinity of the end portions, said first and second auxiliary winding portions having substantially the same number of turns and being positioned along the longitudinal axis at approximately equal distances from the transverse axis;

first and second supplemental winding portions coaxial with the main winding portion, said first and second supplemental winding portions being respectively and substantially aligned with the first and second end portions of the main winding portion, said supplemental winding portions being wound, positioned and connected to increase the magnetic field of the main winding portion in the vicinity of the end portions, said first and second supplemental winding portions having substantially the same number of turns and being positioned along the longitudinal axis at approximately equal distances from the transverse axis;

the auxiliary and supplemental winding portions compensating for the second and fourth order gradients of the main winding portion;

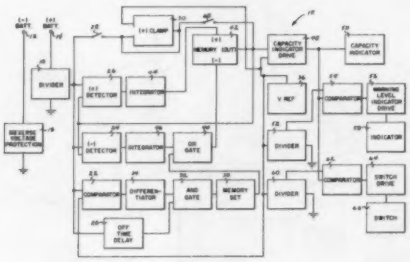
and a further winding portion coaxial with the main winding portion and aligned with the central portion of the main winding portion, said further winding portion having an axial extent such that no part thereof is aligned with any part of the auxiliary winding portion or the supplemental winding portion, said further winding portion having a substantially equal number of turns on opposite sides of the transverse axis, said further winding portion being positioned, wound and connected to increase the magnetic field of the main winding portion in the vicinity of the center portion of the main winding portion.

4,180,770

METHOD AND APPARATUS FOR DETERMINING THE CAPACITY OF LEAD ACID STORAGE BATTERIES

Richard L. Eby, Marshfield, Mass., assignor to Anderson Power Products, Inc., Boston, Mass.

Filed Mar. 1, 1978, Ser. No. 882,323
Int. Cl.[2] G01N *27/42, 27/46*
U.S. Cl. 324—429 **17 Claims**



1. A method for determining the capacity of a lead acid storage battery, said method comprising the steps of:

(1) sensing an initial open circuit voltage of the battery when no current flows through the battery;

(2) storing the value of said initial open circuit voltage;

(3) sensing the voltage of the battery while current flows through the battery in a first direction;

(4) comparing the value of the sensed voltage with the value of the stored initial open circuit voltage to produce a difference value representing the rate of current flow through the battery in said first direction;

(5) adjusting said stored initial open circuit voltage value as a function of said difference value to produce a first direction current flow, adjusted, stored voltage value; and,

(6) utilizing said first direction current flow, adjusted, stored voltage value, said value representing the then capacity of the battery while current flows therethrough in said first direction.

4,180,771

CHEMICAL-SENSITIVE FIELD-EFFECT TRANSISTOR

Henry Guckel, Madison, Wis., assignor to Airco, Inc., Montvale, N.J.

Filed Dec. 2, 1977, Ser. No. 856,935
Int. Cl.[2] G01N *27/56, 31/04;* **A61B** *5/05*
U.S. Cl. 324—71 SN **10 Claims**

1. A field-effect transistor device for measuring a chemical property of a substance to which the device is exposed, comprising:

a semiconductor substrate;

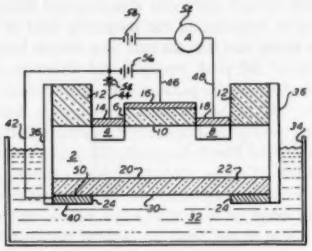
a source region in contact with the substrate and located near a first surface of the substrate;

a drain region in contact with the substrate, located near the first surface of the substrate and spaced apart from the source region;

a gate insulator which overlies a first area of the first surface of the substrate between the source and drain regions;

three electrodes for providing a separate electrical connection to the source region, drain region, and gate insulator; and

a layer of chemically sensitive material which overlies a second area of the substrate separate from the first area



and which has an active surface for exposure to the substance, said chemically sensitive material connected in series with the substrate and located on the opposite side of the substrate from the gate insulator, said second area located sufficiently near the source and drain regions so that exposure of the chemically sensitive material to the substance results in a change of the electrical conductance between the source and drain regions.

4,180,772

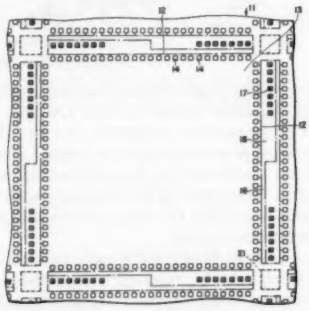
LARGE-SCALE INTEGRATED CIRCUIT WITH INTEGRAL BI-DIRECTIONAL TEST CIRCUIT

Fred K. Buelow, Los Altos Hills, and John J. Zasio, Sunnyvale, both of Calif., assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 31, 1977, Ser. No. 801,906

Int. Cl.[2] G01R *15/12*

U.S. Cl. 324—73 PC **10 Claims**



1. In a large scale integrated circuit, a semiconductor body having a surface, said large scale integrated circuit formed in said semiconductor body through said surface and comprising a large number of interconnected circuit elements and a large number of input and output pads connected to the circuit elements and disposed near the outer perimeter of the semiconductor body, at least one integrated test circuit having interconnected circuit elements formed in the semiconductor body and extending through said surface, said integrated test circuit having a plurality of probe pads carried by the semiconductor body and connected to the test circuit, said integrated test circuit being formed external of but in relatively close proximity to said large scale integrated circuit, said integrated test circuit including bi-directional driver means directionally selectable for writing data into or for reading data from said large scale integrated circuit, said bi-directional driver means including write means responsive to write signals for selecting said bi-directional driver means in a direction to write data into said large scale integrated circuit and including read means responsive to read signals for selecting said bi-directional drive means in a direction to read data from said large scale integrated circuit, said bi-directional driver means connected between one of said probe pads and a plurality of said input and output pads whereby access can be obtained to said large scale integrated circuit through probing of said probe pads.

4,180,773

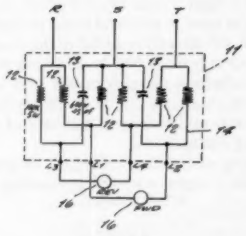
VOLTAGE PHASE TESTING AND INDICATING DEVICE

Monley M. Y. Shiao, c/o George Spector 3615 Woolworth Bldg. 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed May 26, 1977, Ser. No. 800,612

Int. Cl.[2] G01R *25/00, 19/16*

U.S. Cl. 324—86 **1 Claim**



1. A electrical testing device, comprising in combination, a small case containing six resistor elements and two capacitors in an electric circuit connected to three leads extending outward of said small case forming line side connections said leads connected to said circuit between successive pairs of resistor elements said circuit also being connected through four terminals to a pair of neon lamps each of which is connected to two of said terminals, said resistors being in series said capacitors being in series with each other and in parallel with said resistors, said terminals being connected to conductors connecting resistors and capacitors, wherein two terminals are connected to the circuit between two resistors and two other terminals connected between a resistor and capacitor, wherein said small case is removably mounted inside a larger case having a line side and load side connections and terminals and leads being connected to said terminals of larger case and said two lamps are mounted on a removable cover of said larger case, wherein said small case is comprised of three units a first of which contains said six resistor elements and said capacitors in said circuit, said leads connected to said circuit, and a pair of prong receptacles having separate contacts wired to said circuit, a second of said units including a block with said terminals each connected to a half ring formed around two openings receiving a pair of prongs therethrough which are mounted on a third of said units, said prongs each comprising two contacts engaging said lamps which are mounted on said third unit, said prongs, passing through said second unit, engaging said prong receptacles of said first unit.

4,180,774
REGENERATIVE METHOD AND APPARATUS TO CONTROL AN ELASTIC RESET TORQUE IN MOVABLE APPARATUS

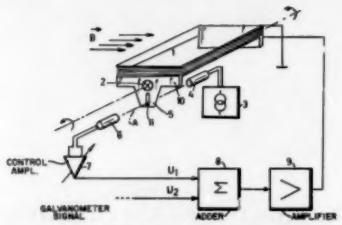
Giovanni Odone, Saint-Sulpice, and Roland Cochard, Morges, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,981

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724811

Int. Cl.[2] **G01R** *1/30, 1/38;* **H03F** *1/40*

U.S. Cl. 324—125 **5 Claims**



1. In an elastic suspension system for a positioning element, positioned under control of a positioning signal,

a method of compensation for elastic restoring torque upon deflection of the system

comprising the steps of

generating a beam of light (A,A') projected in an optical path from a light source (**4**) to a photo detector (**6**);

interrupting at least in part said beam of light by a blocking element (**5, 11**) directly coupled to the positioning element and located at least in part in said optical path;

deriving a deflection signal from the photo detector representative of change of the blocking position of the blocking element in said path upon mechanical deflection of the positioning element;

and combining said deflection signal, as a restoring torque compensation signal with the positioning signal.

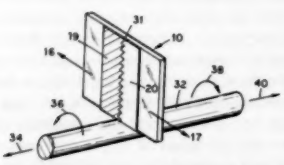
4,180,775
MAGNETIC THIN-FILM SPLIT-DOMAIN CURRENT SENSOR-RECORDER

Edmund J. Hsieh, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 16, 1977, Ser. No. 778,275

Int. Cl.[2] **G01R** *33/02, 19/04*

U.S. Cl. 324—249 **12 Claims**



1. A passive nuclear-radiation hard current sensing and recording system including a magnetic thin film split-domain sensor-recorder, said system comprising:

a current path;

a substrate; and

a unaxial anisotropic magnetic thin film on said substrate, said film having first and second opposing pairs of outer edges, said film including a first portion initially magnetized in a first direction to form a first domain and a second portion initially magnetized in a second direction to form a second domain, said first and second differently magnetized domains having contiguous interior edges forming an initial magnetic boundary in a predetermined location that is parallel to said second pair of edges, said film being oriented with one edge of said first opposing pair of outer edges adjacent said current path, said domains being formed prior to placement of said film adjacent said current path, said domains and boundary being movable in response to the magnetic field of an electric current along said current path to a second location representative of the peak strength and direction of the field and therefore of the peak amplitude and direction of the current, one of said domains, being at least partially switched during the boundary movement so that at least a portion of said film is magnetically uniform between said second pair of edges, said uniformity extending from said one outer edge adjacent said current path towards the opposite edge of said first edge pair a distance that is proportional to the peak strength of the current.

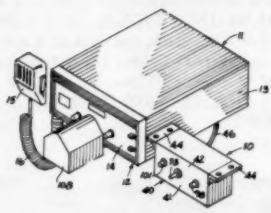
4,180,776
AUTOMATIC CHANNEL SCANNING ATTACHMENT FOR MANUAL CB RADIO TRANSCEIVER

Philip J. Lindemann, P.O. Box 1665, Omak, Wash. 98841

Filed Apr. 27, 1978, Ser. No. 900,413

Int. Cl.[2] **H04B** *1/40*

U.S. Cl. 325—25 **6 Claims**



1. A universal automatic channel scanning attachment for a wide variety of manual channel selector CB radio transceivers adapted to be responsive to squelch circuits that produce squelch signals of positive or negative polarity when the transceivers are not tuned to active channels to enable each transceiver with an attachment to automatically scan the CB frequency channels and tune the transceiver in an active channel; said attachment comprising:

a chassis separated from the CB radio transceiver;

an input electrical wire mounted to the chassis and adapted for extending to the CB radio transceiver and electrically connecting to the transceiver squelch circuit to transmit the squelch signal to the chassis;

a signal polarity network mounted to the chassis and electrically coupled to the input electrical wire for generating a process signal in response to the receipt of the positive or negative squelch signal;

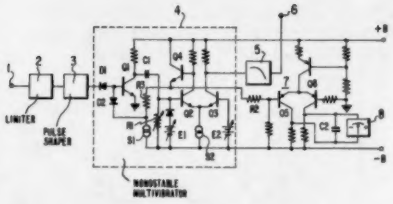
a scanning control network mounted in the chassis and electrically coupled to the signal polarity network for generating a channel scanning signal in response to the squelch signal; and

channel selector actuating means electrically coupled to the scanning control network and adapted to be operatively connected to the manual channel selector of the CB radio transceiver for actuating the manual channel selector to automatically scan the CB channels when the channel scanning signal is generated.

4,180,777
TUNING METER FOR USE WITH A PULSE COUNT FM DEMODULATION CIRCUIT

Tsuneo Yamada, and Yukihiko Miyamoto, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,538
Claims priority, application Japan, Dec. 28, 1976, 51-159460
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—363 **6 Claims**



1. A tuning meter circuit for use with an FM demodulator comprising

means including a monostable multivibrator responsive to a frequency modulated input signal for generating at the output of said monostable multivibrator a train of pulses of substantially constant width, the number of which per unit time interval varies in accordance with the frequency modulation of said input signal;

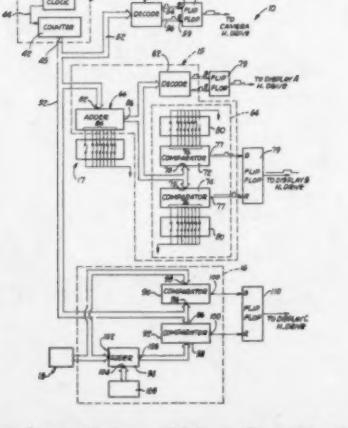
a difference amplifier responsive to said pulse train, said difference amplifier having a threshold level at which it changes state; and

a tuning meter responsive to said difference amplifier the duty cycle of said monostable multivibrator and the threshold level of said difference amplifier being so related that said tuning indicator indicates said FM receiver is tuned when a signal of exact intermediate frequency is applied to said FM demodulator.

4,180,778
DIGITAL SIGNAL PHASE SHIFTING SYSTEM

James C. Worthington, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,272
Int. Cl.[2] H03K 5/15, 5/153, 5/159; H04N 5/04
U.S. Cl. 328—155 **13 Claims**



1. A system for producing multiple cyclic output signals occurring at intervals which are adjustably variable comprising:

(a) a timing signal generator having an output producing cyclic digitalized timing signals;

(b) a first system output signal generator having an input connected to said timing signal generator output and at least one output forming a first system output, said first system output signal generator producing at least a first system output signal in response to the occurrences of a predetermined timing signal generator output;

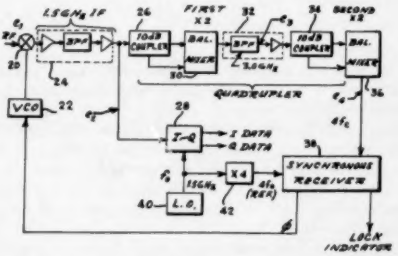
(c) a second system output signal generator having a first input receiving said timing signal generator output, a second input, and a plurality of outputs defining second system outputs; and

(d) setting means connected to said second input of said second system output signal generator, said setting means producing an adjustable setting signal conditioning said second output signal generator to produce said plurality of second system output signals in response to occurrences of a timing signal generator output signal bearing a selected temporal relationship to said predetermined timing signal generator output signal.

4,180,779
QPSK DEMODULATOR WITH TWO-STEP QUADRUPLER AND/OR TIME-MULTIPLEXING QUADRUPLING

William R. Hook, Los Angeles, and Ronald P. Hilberg, Redondo Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 21, 1978, Ser. No. 944,440
Int. Cl.[2] H04L 27/22
U.S. Cl. 329—50 **7 Claims**



1. A quadrupler demodulator apparatus comprising in combination:

a first doubler unit to receive an input signal, said input signal having a center frequency with a predetermined bandwidth, said first doubler unit doubling said input signal to provide a first bi-phase output signal, said first bi-phase output signal being centered at twice the center frequency of said input signal and having substantially the same predetermined bandwidth as said input signal,

a bandpass filter unit receiving said first bi-phase output signal, said bandpass filter unit having the same bandwidth as said predetermined bandwidth of said input signal, said bandpass filter unit filtering out and removing any undesired cross products, said bandpass filter unit recovering and maintaining said first bi-phase output signal, said bandpass filter unit providing said first bi-phase output signal as an output,

a second doubler unit connected to said bandpass filter unit to receive said first bi-phase output signal as an input signal, said doubler unit doubling said first bi-phase output signal to provide a CW output signal, said CW output signal being centered at four times the center frequency of said input signal, and

a phase lock loop connected between the output of said second doubler unit and the input of said first doubler unit, said phase lock loop receiving said CW output signal, said

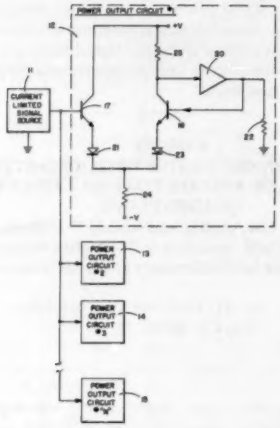
phase lock loop generating a reference signal which has a frequency of four times the center frequency of said input signal, said phase lock loop generating a phase error signal which is responsive to the relationship between said CW output signal and said reference signal.

4,180,780

INPUT DECOUPLING CIRCUIT FOR TRANSISTOR DIFFERENTIAL AMPLIFIER

Paul S. Rumbaugh, Garden Grove, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Oct. 2, 1978, Ser. No. 947,629
Int. Cl.[2] H03F *3/45*
U.S. Cl. 330—252 **5 Claims**



1. In a power amplifier system comprising a plurality of output circuits having separate output loads and receiving their inputs from a common signal source, at least one of said output circuits including a transistor differential amplifier, the improvement being means for providing decoupling between the output of said one of said circuits and the output of said signal source to prevent a short circuit in the output of said one of said circuits from loading down the output of said signal source, comprising:

diode means connected in the emitter circuits of said one of said transistor differential amplifiers, said diode means having a reverse breakdown voltage greater in magnitude than the maximum peak to peak value of the output of said signal source.

4,180,781

BIASING AND DRIVE CIRCUITRY FOR QUASI-LINEAR TRANSISTOR AMPLIFIERS

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

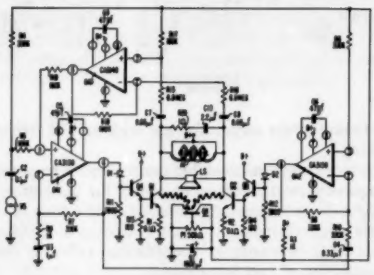
Filed Jun. 5, 1978, Ser. No. 912,331
Int. Cl.[2] H03F *3/26*
U.S. Cl. 330—272 **7 Claims**

1. In an amplifier including a first transistor means with base and emitter and collector electrodes; means connecting said first transistor means for operation in a first common-emitter amplifier configuration including a connection of its emitter electrode to a point of reference potential; and bias potential supply means sensitive to the temperature of said first transistor means for supplying a bias potential, a temperature-compensated component of which if applied via direct coupling to the base of said first transistor means would result in substantially invariant collector idling current despite change in the temperature of said first transistor means, the improvement comprising:

a first high-gain differential-input amplifier having a non-inverting input terminal to which said bias potential is applied, having an inverting input terminal, and having an output terminal;

a first resistance with first and second ends respectively connected to the output terminal of said first differential input amplifier and to its inverting input terminal for maintaining its inverting input terminal at substantially the same quiescent potential as at its non-inverting input terminal and thereby referring the quiescent potential at its output terminal to the bias potential applied to its non-inverting input terminal;

first direct coupling means for direct coupling the output terminal of said first differential-input amplifier to the base electrode of said first transistor means;



means for superimposing an input signal on the quiescent potential at one of the input terminals of said first differential-input amplifier; and

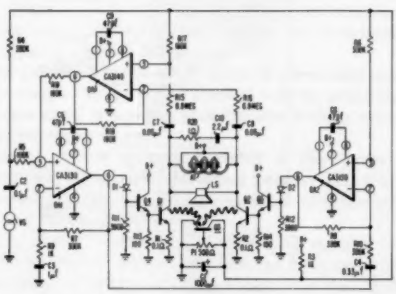
a second resistance with a first end connected to the inverting input terminal of said first differential input amplifier and with a second end connected for dividing the signal variations fed back from the output terminal of said first differential-input amplifier to its inverting input terminal via said first resistance, for causing a response to said input signal to be superimposed on the quiescent potential at the output terminal of said first differential-input amplifier, which response is proportionally related to said input signal by a factor dependent on the values of said first and second resistances.

4,180,782

PHANTOM FULL-BRIDGE AMPLIFIER

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,394
Int. Cl.[2] H03F *3/26*
U.S. Cl. 330—276 **4 Claims**



1. A phantom full-bridge amplifier for supplying oppositely-phased push-pull drives to first and second ends of a load, for

permitting the first and second ends of said load to be driven sufficiently to provide an output voltage across said load with a range substantially at least four times as large as a restricted difference available between reference and operating potentials, said phantom full-bridge amplifier comprising:

first and second supply terminals for receiving said operating and reference potentials, respectively;

first and second load terminals for connection to the first and second ends, respectively, of said load;

first and second transistor means of the same conductivity type each having respective input and output and common electrodes;

means for maintaining the common electrodes of said first and second transistor means substantially at said reference potential, including

first direct current conductive means connecting the common electrode of said first transistor means to said second supply terminal, and

second direct current conductive means connecting the common electrode of said second transistor means to said second supply terminal;

push-pull driver means responsive to an input signal for supplying push-pull signals to the input electrodes of said first and second transistor means, said push-pull driver means being of a type such that said push-pull signals are developed responsive to said input signal by transformerless means for avoiding phase shift through said push-pull driver means such that excursions of said input signal in a first sense render said first transistor means more conductive and said second transistor means less conductive, such that sufficiently large excursions of input signal in said first sense render said second transistor means non-conductive, such that excursions of input signal in a second sense opposite to the first sense render said first transistor means less conductive and said second transistor means more conductive, such that sufficiently large excursions of input signal in said second sense render said first transistor means nonconductive; and

means responsive substantially solely to the currents flowing through the output electrodes of said first and second transistor means for providing oppositely-phased push-pull drives at said first and second load terminals, respectively, essentially consisting of

a step-up autotransformer winding having a first half connected between said first load terminal and said first supply terminal, having a second half connected between said second load terminal and said first supply terminal, and having the output electrodes of said first and second transistor means respectively connected to points in its first and second halves equally remote from their connections to said first supply terminal and sufficiently so that the self inductance thereof is sufficient for producing an output voltage of said range substantially free of phase distortion.

4,180,783

PHASE LOCK LOOP DATA TIMING RECOVERY CIRCUIT

Jacob R. Khalifa, Mt. Laurel, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,855

Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—2 **4 Claims**

1. A phase locked loop, comprising

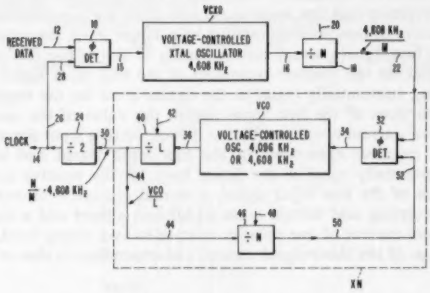
a phase detector having a signal input and a reference input,

a voltage-controlled oscillator responsive to the output of said phase detector,

a feedback loop from said oscillator to the reference input of said phase detector,

a divider in said feedback loop to divide the frequency by an integer, and

a programmable multiplier in said feedback loop to multiply the frequency by an integer, said programmable multiplier



consisting of a phase locked loop including a divider in its feedback path.

4,180,784

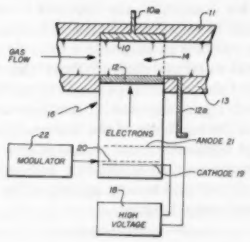
FREQUENCY MODULATED ELECTRICAL DISCHARGE LASER

Donald J. Nelson, Seattle; Denis J. Pistoresi, Kent, and Michael F. Weisbach, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 19, 1977, Ser. No. 834,289

Int. Cl.[2] H01S *3/097*

U.S. Cl. 331—94.5 PE **10 Claims**



1. In a laser in which the inversion population is enhanced by a factor or factors other than the input power applied to the laser, such as by molecular collisions in a gas laser, wherein the improvement comprises:

means for modulating the input power applied to the laser, which has a given amplitude, by a modulating signal having a modulation frequency and a modulation amplitude; and

control means establishing the modulation frequency and modulation amplitude at levels such that the average power output of the laser increases for the given amplitude of input power.

4,180,785

MODULATOR FOR FORMING THE PRODUCT OF TWO INPUT SIGNALS

Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 27, 1978, Ser. No. 900,711

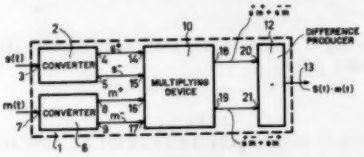
Claims priority, application Netherlands, Jun. 7, 1977, 7706237

Int. Cl.[2] H03C *1/52*

U.S. Cl. 332—9 T **6 Claims**

1. A modulator for amplitude modulation of a first input signal having positive and negative excursions relative to a

reference level with a second input signal also having positive and negative excursions relative to a reference level, said input signals being suppressed during the modulator process and only the product terms being obtained as an output signal, wherein the modulator comprises a first converter circuit for converting said first input signal into a first and a second signal current of one polarity relative to a datum level, the value of the first signal current corresponding to that of the first input signal for the positive excursions of the first input signal and being substantially equal to the datum level for the negative excursions of the first input signal, the value of the second signal current corresponding to that of the first input signal for the negative excursions of the first input signal and being substantially equal to the datum level for the positive excursions of the first input signal, a second converter circuit for converting said second input signal into a third and a fourth signal current of one polarity relative to said datum level, the value of the third signal current corresponding to that of the



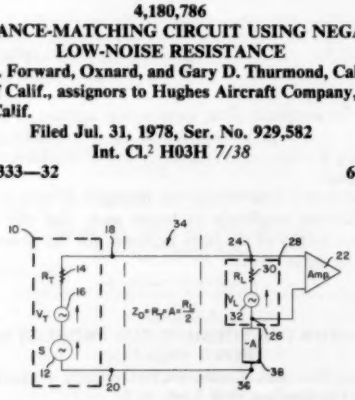
second input signal for the positive excursions of said second input signal and being substantially equal to said datum level for the negative excursions of said second input signal and the value of the fourth signal current corresponding to that of the second input signal for the negative excursions of said second input signal and being substantially equal to said datum level for the positive excursions of said second input signal, and a multiplying device coupled to the first and to the second converter circuits and having first and second outputs, said multiplying device supplying in response to the first second third and fourth signal currents derived from the two converter circuits the sum of the products of the first and third and of the second and fourth signal currents at said first output and supplying the sum of the products of the first and fourth and of the second and third signal currents at said second output, and a difference producer coupled to the first and second outputs of the multiplying device and having an output for producing the desired modulated output signal.

4,180,786

IMPEDANCE-MATCHING CIRCUIT USING NEGATIVE LOW-NOISE RESISTANCE

Robert L. Forward, Oxnard, and Gary D. Thurmond, Calabasas, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 31, 1978, Ser. No. 929,582
Int. Cl.[2] H03H *7/38*
U.S. Cl. 333—32 **6 Claims**



1. A circuit for impedance matching electrical signal-processing circuitry having first and second input terminals to a source of electrical signals having first and second output terminals and a given characteristic source resistance comprising:

means coupled between said first and second input terminals for providing a load resistance approximately equal to twice said source resistance;

means coupled between said second input terminal and said second output terminal for providing a negative low-noise resistance approximately equal in magnitude to said source resistance; and

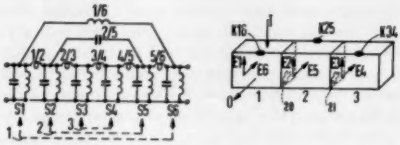
means for intercoupling said first output terminal and said first input terminal.

4,180,787

FILTER FOR VERY SHORT ELECTROMAGNETIC WAVES

Gerhard Pfitzenmaier, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,530
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654283
Int. Cl.[2] H01P *7/06, 1/20, 1/16*
U.S. Cl. 333—212 **6 Claims**



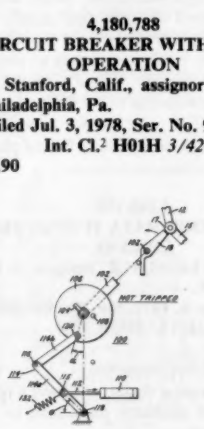
1. A micro-wave filter comprising: a plurality of sequentially connected filter circuits; a plurality of resonators, each resonator operating as two of said filter circuits, said resonators operating in a dual mode; individual resonators of said plurality being arranged next to one another in a row; the filter circuits all being coupled in a predetermined sequential mode of electrical operation; first and last filter circuits being provided with connection line means for input and output of micro-waves, respectively; all sequentially adjacent resonators having coupling means therebetween for coupling the micro-waves therebetween without mode change; and at least one resonator providing two filter circuits which are not directly adjacent in the sequential mode of electrical operation and are coupled via an additional coupling.

4,180,788

VACUUM CIRCUIT BREAKER WITH DELAYED TRIP OPERATION

Philip Barkan, Stanford, Calif., assignor to General Electric Company, Philadelphia, Pa.

Filed Jul. 3, 1978, Ser. No. 921,938
Int. Cl.[2] H01H *3/42*
U.S. Cl. 335—190 **21 Claims**



1. In combination with an electric circuit breaker, means for providing a predetermined delay between the initiation of a command pulse and the mechanical operation of an element of

the circuit breaker in response to the command pulse, which comprises:

(a) axial shaft means mechanically coupled to said element of said circuit breaker which is to be operated wherein a preselected rotation of said shaft means causes said mechanical operation of said element, said axial shaft means including impact receiving means extending radially from said shaft means;

(b) flywheel means rotatable about said axial shaft means, said flywheel means including impact imposing means extending generally axially outward from a major face of said flywheel means;

(c) an electric solenoid having a translatable armature for rotating said flywheel means, said electric solenoid receiving said command pulse; and

(d) coupling means mechanically coupling said translatable armature to an eccentrically located point on said flywheel means wherein translation of said armature causes said flywheel means to rotate through said predetermined delay from a first position not operating said element of said circuit breaker to a second position operating said element wherein at said second position said impact imposing means of said flywheel means engages said impact receiving means of said shaft means and causes said preselected rotation of said shaft means and said operating of said element.

4,180,789

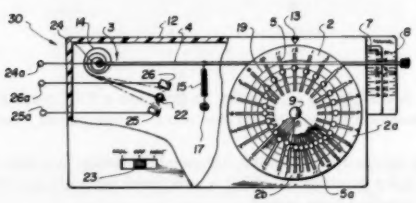
TIME VARIABLE THERMOSTAT

Frank Martucci, 360 Tom Hunter Rd., Fort Lee, N.J. 07024

Filed Jul. 10, 1978, Ser. No. 923,067

Int. Cl.[2] H01H *37/62*

U.S. Cl. 337—301 **9 Claims**



1. A time variable thermostat for controlling a heater comprising, a temperature actuated switch connected to the heater for actuating the heater at a selected temperature having a movable contact and at least one fixed contact, said movable contact being moved out of engagement with said fixed contact when the selected temperature is reached to deactivate the heater and being movable into engagement with the fixed contact to activate the heater when a selected temperature has not been reached, a temperature selection arm connected to said movable contact for selecting the temperature at which said movable contact is out of engagement with said fixed contact, a clock motor having a shaft rotatable once in 24 hours associated with said temperature selection arm, a temperature selection disc connected to said shaft having a plurality of radially extending slots, at least one arm engagement pin slidably mounted within each of said slots and engageable with said temperature selection arm, each of said arm engagement pins being radially positionable along said associated slot which corresponds to a selected temperature, and biassing means biassing said temperature selection arm against at least one of said arm engagement pins.

4,180,790

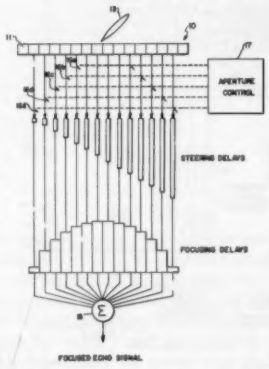
DYNAMIC ARRAY APERTURE AND FOCUS CONTROL FOR ULTRASONIC IMAGING SYSTEMS

Charles E. Thomas, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,597

Int. Cl.[2] G01S *9/66*

U.S. Cl. 367—7 **6 Claims**



1. An ultrasonic imaging system with improved lateral resolution comprising:

a linear array of transducer elements which are selectively operative during alternate transmission and echo reception periods to sequentially generate pulses of ultrasound for scanning an object region and to generate received echo electrical signals,

a plurality of transmitting channels for producing excitation pulses for selected array elements, and a plurality of receiving channels connected to the array elements for delaying the echo signals for variable predetermined time delays to focus the received echoes,

aperture control means for increasing the number of active array elements and receiving channels as a function of range during each echo reception period such that a central group of receiving channels are initially active and thereafter pairs of receiving channels, one on either side, are additionally rendered active whereby the array aperture is increased by steps at least during the interval the range does not exceed the maximum aperture,

means for adjusting the receiving channel time delays at least once during each echo reception period to dynamically focus the received echoes at a plurality of focal points at different ranges, and

means for summing the delayed echo signals from all active receiving channels to thereby generate a focused echo signal.

4,180,791

SIMPLIFIED SECTOR SCAN ULTRASONIC IMAGING SYSTEM

Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1978, Ser. No. 884,951

Int. Cl.[2] G01S *9/66, 9/68;* G01N *29/00*

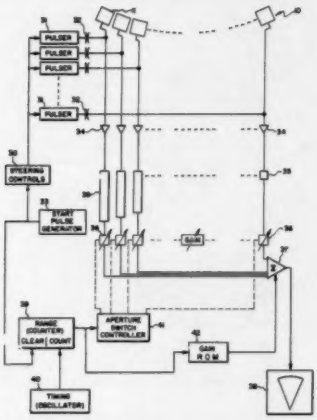
U.S. Cl. 367—105 **12 Claims**

1. A sector scan ultrasonic imaging system comprising: a transducer array assembly including a row of transducer elements at physical locations such that there are equal time delays for sound propagating from a focus to all elements of the array, said array elements being selectively operable during alternate transmission and echo reception periods to generate angulated beams of ultrasound for scanning an object region and to generate received echo electrical signals,

a plurality of transmitting channels for producing array

element excitation pulses in time sequence, and a plurality of receiving channels for variably delaying the received echo signals to focus the echoes,

aperture control means for increasing the number of active array elements and receiving channels as a function of range during each echo reception period such that a central group of receiving channels are initially active and



thereafter pairs of receiving channels, one on either side, are additionally rendered active to change the array aperture by steps between the minimum range and a specified fraction of maximum range, the full aperture being maintained thereafter out to maximum range, and

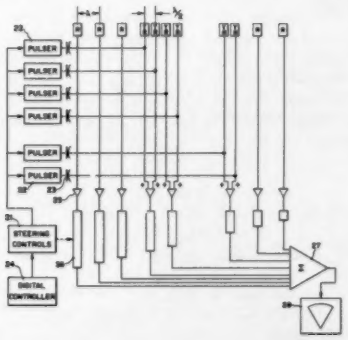
means for summing the delayed echo signals from all active receiving channels to generate a focused echo signal.

4,180,792

TRANSMIT-RECEIVE TRANSDUCER ARRAY AND ULTRASONIC IMAGING SYSTEM

Frank L. Lederman, and Jerome J. Tiemann, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1978, Ser. No. 884,952
Int. Cl.[2] G01S *9/66*
U.S. Cl. 367—7 **10 Claims**



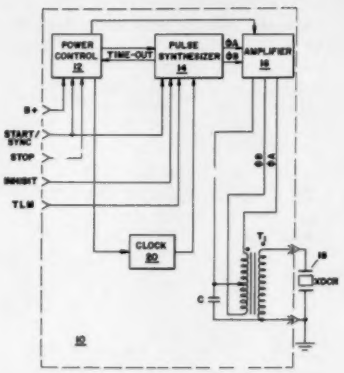
1. A transmit-receive transducer array for steered beam ultrasonic imaging systems including a single row of electroacoustic transducer elements comprised of a shorter transmit array of equally spaced transmit elements that is approximately centered within a longer receive array of equally spaced unit receive elements, the spacing between said transmit elements being substantially less than the spacing between said unit receive elements so that the grating side lobe upon transmission is at a substantially greater angle from the main beam than is the grating side lobe upon reception and the product of side lobe sensitivities is small, the center portion of said row of transducer elements being comprised solely of transmit-receive elements and either end portion of said row being comprised of receive-only elements, said receive-only elements being unit receive elements, and means for electrically coupling together adjacent transmit-receive elements by groups during reception such that each group functions as a unit receive element.

4,180,793

PSK PULSE SYNTHESIZER

Alan L. Lindstrum, Bainbridge Island, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,211
Int. Cl.[2] H04B *1/02, 11/00*
U.S. Cl. 367—137 **10 Claims**



1. A PSK pulse synthesizer to generate a PSK message for transmission by an underwater acoustic transmitter comprising:

(a) means for providing independent timing for said PSK pulse synthesizer which is synchronized with an external standard time period;

(b) means for selecting a unique identification code;

(c) means for generating a PSK pulse wave train; and

(d) means for selectively modulating said PSK pulse wave train by said unique identification code and by status and telemetry data.

4,180,794

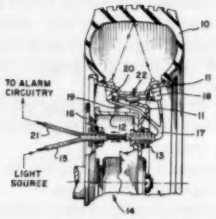
TIRE DEFLECTION SENSING METHOD AND APPARATUS

William E. Claxton, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 7, 1978, Ser. No. 958,477
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—58 **22 Claims**

1. Apparatus for determining the degree of deflection of a pneumatic tire comprising a light source, means for transmitting the light from said light source to a position internally of the tire to reflect the same off an internal surface of the tire,

circuit means for providing an indication of the deflection of the tire, and means for transmitting the reflected light to said



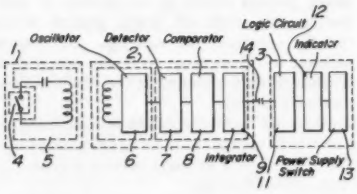
circuit means, said circuit means translating the quantity of reflected light into an indication of the deflection of the tire.

4,180,795

ALARM DEVICE FOR INFORMING REDUCTION OF PNEUMATIC PRESSURE OF TIRE

Akira Matsuda, Higashi-Murayama; Makoto Tanaka; Junichi Murata, both of Kodaira; Shigeo Yasuda, and Hiroshi Nishino, both of Musashino, all of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo and Mitaka Instrument Company Limited, Musashino, both of, Japan

Filed Dec. 12, 1977, Ser. No. 859,517
Claims priority, application Japan, Dec. 14, 1976, 51-150235
Int. Cl.[2] B60C *23/02*
U.S. Cl. 340—58 **5 Claims**



1. An alarm device for informing reduction of pneumatic pressure of a tire by converting an abnormal change of the pneumatic pressure into an electric signal and generating an alarm, the device comprising:

at least one oscillator means having an oscillation coil fixed on a chassis side of a vehicle and changing its oscillation state of electromagnetic waves in accordance with an abnormal change of the pneumatic pressure;

a resonator means fixed to the peripheral portion of a wheel having a tire adjacent the oscillation coil and consisting of a resonance coil and a capacitor capable of resonating with the electromagnetic wave radiated from said oscillation coil and a pressure sensing switch for sensing an abnormal change of the pneumatic pressure;

a signal processing device provided for each oscillator and including a detector means for detecting the output of the oscillator, a comparator means for comparing the present output of the detector with a preceding output of the detector to generate an output pulse, an integrator means for integrating the output pulse of the comparator, and a logic circuit means for logically operating the output of the integrator; and

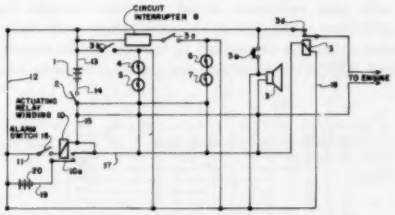
an alarm means for generating a warning signal in accordance with the output of the signal processing device.

4,180,796

VEHICULAR BURGLAR ALARM SYSTEM

Jose L. Palafox, P.O. Box 74, Dunlap, Calif. 93621

Filed May 22, 1978, Ser. No. 907,935
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—64 **2 Claims**



1. A vehicular burglar alarm system for an automotive vehicle having an engine, a battery, an ignition circuit including an ignition switch and the battery for operating the engine, a horn circuit including a horn, a horn actuating switch and the battery, a headlight circuit including headlights, a headlight energizing switch and the battery, and an emergency light circuit including emergency lights, an emergency light energizing switch and the battery, said vehicular burglar alarm system comprising

an auxiliary ignition circuit switch connected in the ignition circuit and being normally closed;

a control relay having a control relay energizing winding and a plurality of control relay contact switches controlled in operation by said control relay energizing winding including the horn actuating switch, the headlight energizing switch, the emergency light energizing switch and the auxiliary ignition circuit switch;

an actuating relay having an actuating relay energizing winding and an actuating relay contact switch controlled in operation by said actuating relay energizing winding;

an alarm switch;

an auxiliary battery;

first circuit means having electrical conductors electrically connecting the battery of the vehicle, the ignition switch, the actuating relay energizing winding and the alarm switch in circuit whereby when the ignition switch is closed by a thief after the alarm switch is closed by the owner of the vehicle the actuating relay energizing winding is energized; and

second circuit means having electrical conductors electrically connecting the auxiliary battery, the actuating relay contact switch and the control relay energizing winding in circuit whereby when the actuating relay energizing winding is energized it closes the actuating relay contact switch and energizes the control relay energizing winding, said control relay energizing winding when energized closing the horn actuating switch to sound the horn, closing the headlight energizing switch to energize the headlights, closing the emergency light energizing switch to energize the emergency lights and opening the auxiliary ignition switch to cut off the engine.

4,180,797

DIGITAL COMPARATOR CONSTRUCTED OF IIL

Ryushi Shimokawa, Fuchu, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 23, 1978, Ser. No. 936,136
Claims priority, application Japan, Sep. 7, 1977, 52-106590
Int. Cl.[2] G06F *7/04*
U.S. Cl. 340—146.2 **6 Claims**

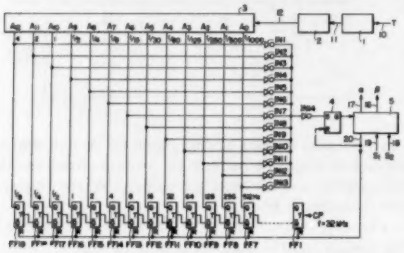
1. A digital comparator comprising:

an information output circuit which has a plurality of output terminals and which represents a predetermined informa-

tion with a digital signal appearing at a selected one of the output terminals, said information output circuit including switching transistors at an output stage respectively connected to said output terminals;

a reference signal generator circuit which has a plurality of output terminals disposed in correspondence with those of said information output circuit and which sequentially impresses reference signals on the respective output terminals, said reference signal generator circuit including switching transistors at an output stage with their respective collectors connected to said output terminals;

wired AND circuits which are made up of connection lines



respectively connecting collectors of the output-stage switching transistors of said information output circuit and the output-stage switching transistors of said reference signal generator circuit corresponding thereto, and output lines disposed for the respective connection lines;

a NOR circuit which is made up of inverter circuits constructed of integrated injection logic (IIL) and incorporated in the respective output lines of said wired AND circuits, and a common connection line for electrically connecting outputs of said inverter circuits in common; and

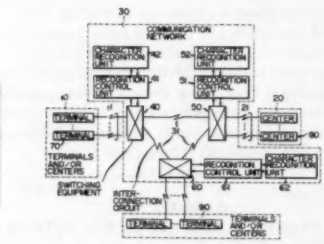
a memory circuit which is driven by an output of said NOR circuit.

4,180,798

CHARACTER RECOGNITION AND COMMUNICATION SYSTEM

Kazuaki Komori, Yokosuka, and Hirofumi Kaiyoh, Kanagawa, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 3, 1978, Ser. No. 874,827
Claims priority, application Japan, Feb. 9, 1977, 52-13298
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 H **7 Claims**



1. A character recognition communication system comprising:

a plurality of terminals, each terminal including a general-purpose facsimile unit having a scanning means for transmitting characters on a document medium as image signals;

at least one center for receiving a message which includes character codes to thereby effect output processing and data processing; and

a communication network connected between said message receiving center and said terminals for receiving the image signals from the terminals, recognizing characters, constructing a message according to the result of character recognition and transmitting said message to the message receiving center designated by an address data included in the result of character recognition, said communication network comprising:

a switching device for switching the image signals from said terminals and transmitting the same to said message receiving center;

a character recognition unit coupled to said switching device for recognizing characters;

a recognition control unit coupled between said switching device and said character recognition unit for controlling said character recognition unit to recognize characters from the individual image signals from said terminals, said recognition control unit comprising:

an image signal receiving unit for receiving said image signals from said terminals and for delivering image signals and control signals necessary to achieve character recognition;

an image signal converting unit for converting the image signals from said image signal receiving unit to binary output signals, the values of which are controlled by said control signals from said image signal receiving unit, said image signal converting unit generating a completion signal representing completion of conversion of said image signals;

a memory having addresses any one of which stores said output signals of said image signal converting unit as an image pattern;

a communication control unit for causing, in response to said completion signal from said image signal converting unit, said character recognition unit to recognize the image pattern stored in an address of said memory, storing the result of image pattern recognition to thereby construct the message, and transmitting the message to the message receiving center designated by an address data included in the result of image pattern recognition; and

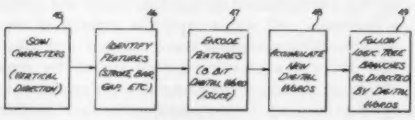
transmitting and receiving means for operating said switching device to connect said recognition control unit to said terminals or to said message receiving center by means of an interconnecting line.

4,180,799

APPARATUS AND METHOD FOR RECOGNIZING CHARACTERS

William R. Smith, Mountain View, Calif., assignor to Caere Corporation, Los Gatos, Calif.

Filed Apr. 21, 1978, Ser. No. 898,822
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 AC **20 Claims**



1. An apparatus for recognizing characters such as alphanumeric characters comprising:

scanning means for viewing a character and for providing video signals representative of generally parallel slices of such character;

feature extraction means, coupled to receive said video signals from said scanning means, for detecting features from said signals as they are received and for assigning

predetermined codes to said detected features, said feature extraction means providing a sequence of coded signals representing said detected features for said generally parallel slices of such character;

logic tree means, coupled to receive said coded signals from said feature extraction means each time a change occurs in said coded signals, for logically evaluating each of said coded signals to determine the possible characters having features corresponding to said coded signals, such tree means narrowing such possible characters as said coded signals are evaluated until such character is identified;

whereby characters are identified without storage of video data.

4,180,800

CHARACTER READING SYSTEM

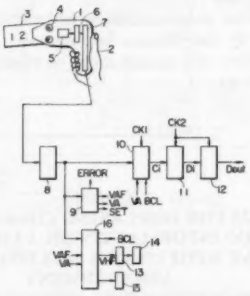
Isao Isshiki; Akihiro Ohoka, and Koji Sato, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1978, Ser. No. 922,415

Claims priority, application Japan, Jul. 7, 1977, 52-81179; Jul. 7, 1977, 52-81180; Jul. 7, 1977, 52-81181

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 SY **12 Claims**



1. A method of reading characters of the type including the steps of scanning a character with a sensor having an array of photosensitive elements so that the illuminated or nonilluminated elements in said array correspond to segments of said character which collectively form an image of said character and processing the output signals from said elements to thereby identify the scanned character, wherein the improvement is characterized by said processing step comprising:

determining the character area of said array in which said image is formed;

analyzing the output signals from each row or column of the elements within said character area and assigning a true classification value to each row or column representative of the pattern of illuminated and non-illuminated elements therein;

analyzing the sequence of at least some of said true classification values in order to identify said character; and

detecting the presence or absence of a character segment in a column of elements near one side of said character area to thereby determine the direction of movement of said scanner relative to said character.

4,180,801

SYSTEM FOR SUPERVISING CONNECTION POINTS

Philippe Cailloux, Chatenay-Malabry, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

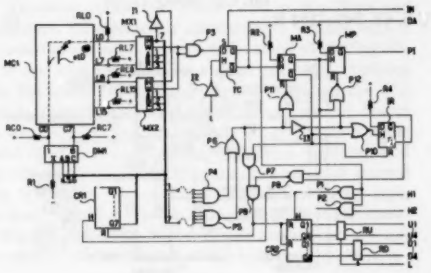
Filed Oct. 7, 1977, Ser. No. 840,458

Claims priority, application France, Oct. 13, 1976, 76 30743

Int. Cl.[2] H04Q *3/00*; G08B *19/00*

U.S. Cl. 340—147 R **5 Claims**

1. A system for supervising connection points and for indicating changes of state among the supervised connection points; the system comprising cyclic electronic scanners, each scanner scanning a field of connection points for detecting and identifying such a change of state, and comprising means for detecting the states of their supervised points and means for making a change of state with a drive signal which is maintained until the occurrence of at least one scanning cycle without detection of any change of state in said field of connection



points, the system further comprising a control unit having means for cyclically observing the scanners, means for stopping the cyclic observation when encountering a marked change of state, means for displaying change of state at least temporarily and means for testing the drive signal of the scanner which has caused the interruption of the control unit to maintain the control unit in observation on the same scanner until the said drive signal has disappeared.

4,180,802

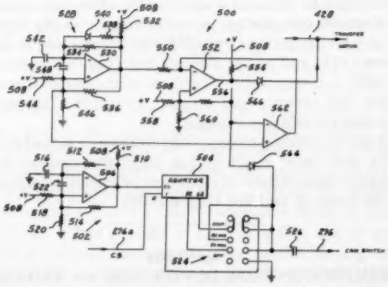
RANDOM AUTOPLAY

Gerard J. Oosterhouse, Grand Rapids, Mich., assignor to Rowe International, Inc., Whippany, N.J.

Filed Mar. 13, 1978, Ser. No. 885,572

Int. Cl.[2] G11B *19/08*; G06F *11/00*; H04Q *9/14*

U.S. Cl. 340—162 **15 Claims**



1. In a system having a user-actuated selector means for selecting one of a plurality of musical recordings, a memory having locations corresponding to said recordings, means responsive to said selector means for storing a signal in the memory location corresponding to said selected recording, means for searching said memory for a location containing said signal, and means responsive to said searching means for playing the recording corresponding to said location, the improvement comprising means independent of said memory for playing a randomly selected one of said recordings.

4,180,803
REMOTE CONTROL SYSTEM WITH PULSE ADDRESSING, AND SAFETY WARNING INDICATION

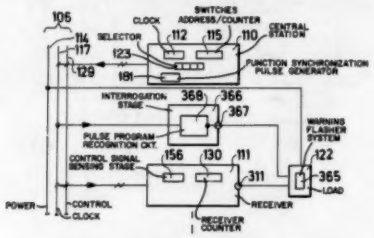
Jürgen Wesemeyer, Nuremberg, and Georg Haubner, Berg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,487

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647823

Int. Cl.[2] H04Q *11/04*

U.S. Cl. 340—164 R **10 Claims**



1. Remote control system for selection of at least one of a plurality of selectrively switchable loads (**122**) from a central station (**110**) connected together by a bus system (**106**),

wherein the bus system includes a power bus (**114**), a clock bus (**117**), and a control bus (**129**);

wherein said central station (**110**) includes

a clock source (**112**),

timing means (**115**, **181**) selecting a first time interval corresponding to a predetermined number of clock pulses to define a selection cycle of clock pulses, and a second time interval to define a control signal separating sequential selection cycles, the timing means (**115**, **181**) being connected to said bus system (**106**) and and include means to, selectively and successively, connect

(a) the clock pulses to the clock bus (**117**) during said first time interval forming the selection cycle and

(b) the clock pulses to the control bus (**129**) during pulse gaps or pauses of clock pulses on a clock bus (**117**) and defining the control signal, and forming function synchronization pulses;

and wherein each load (**122**) includes

a receiver (**111**) connected to said bus system (**106**) and responsive to clock pulses, the control signal, and address control pulses on the bus system to cause an operating function to occur at a specifically addressed receiver,

said system comprising, in accordance with the invention,

a pulse interrogation stage (**366**, **366'**) connected to the clock bus (**117**) and to the control bus (**129** of the bus system (**106**) and responsive to pulses on the respective buses of the bus system, and sensing continuing recurrence of pulses on said bus system;

and alarm warning means (**365**) connected to and controlled by said pulse interrogation stage to provide an output signal upon failure of detection of pulses on either one of the buses of said bus system (**106**).

4,180,804
REMOTE CONTROL DEVICE FOR AN AMPLIFIER TRAP CIRCUIT

Masakatsu Watanabe, Tokyo; Minoru Nakada, Tokorozawa, and Takeshi Takeuchi, Yokohama, all of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 912,155

Claims priority, application Japan, Jun. 2, 1977, 52-72016[U]

Int. Cl.[2] H04B *1/10*

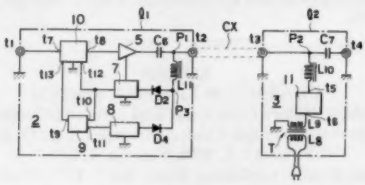
U.S. Cl. 340—310 R **11 Claims**

1. A remote control device for a trap circuit in an amplifier which is inserted in a signal transmission line in the vicinity of a television community receiving system antenna and is energized through said signal transmission line by a power supply unit in a subscriber's house, comprising:

a first diode in said power supply unit for supplying a first half cycle of an A.C. power supply signal to said amplifier;

a second diode in said power supply unit for supplying the second half cycle of said A.C. power supply signal to said amplifier when connected to said A.C. signal;

a switch in the subscriber's home for connecting and disconnecting said second diode from said A.C. power signal;



a D.C. power supply section in said amplifier which receives the first half cycle from said first diode and supplies said first half signal as an amplifier power signal to an amplifier section; and

a trap circuit switch means in said amplifier which is controlled by the presence and absence of said second half cycle from said second diode to enable and disable said trap circuit.

4,180,805
SYSTEM FOR DISPLAYING CHARACTER AND GRAPHIC INFORMATION ON A COLOR VIDEO DISPLAY WITH UNIQUE MULTIPLE MEMORY ARRANGEMENT

David C. Burson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 6, 1977, Ser. No. 785,006

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—709 **10 Claims**

1. A system for displaying character or other graphic information on a color video display comprising:

(a) digital processor means for generating a display image in digital-coded form;

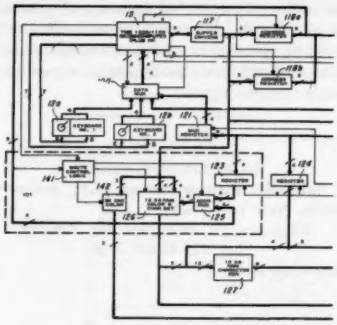
(b) first random access display memory means coupled to said digital processor means for storing said display image in said digital coded format, each memory word of said display memory being partitioned into at least first and second bytes;

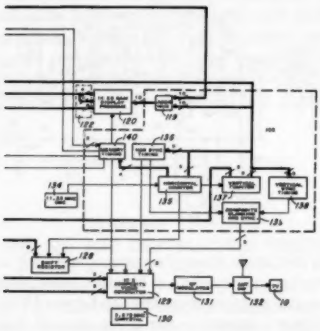
(c) second addressable character table memory means being coupled to said first memory means, said second memory means being addressed by the first byte of memory words read from said first memory means, each word of said second memory means being partitioned into at least first and second bytes;

(d) third addressable character generator memory means having stored therein a plurality of characters or other graphic information in display-coded format, said first and second memory means being coupled to said third memory means with said third memory means being addressed by the second byte of said first memory means and the second byte of said second memory means to select a character or other graphic information to be displayed, the first byte of the second memory means being indicative of the color of the selected character; and

(e) video signal generator means coupled to said second and third memories and responsive to the first byte of said second memory means and to the character or other

graphic information stored in the addressed location of said third memory means to produce a color image of the





selected character or other graphic information on said color video display.

4,180,806

ARRANGEMENT, IN PARTICULAR AN ANALOG-DIGITAL CONVERTER AND METHOD OF OPERATION THEREOF

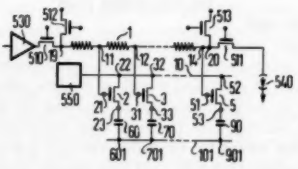
Kurt Hoffmann, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 612,570, Sep. 11, 1975, Pat. No. 4,091,378. This application Sep. 19, 1977, Ser. No. 834,786

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1974, 2445142

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD **1 Claim**



1. A method of operating an analog-digital converter having a resistance line and a plurality of voltage comparators, each comprising a transistor and a load element in the form of a capacitor, in which the control electrode of each transistor forms a first comparator input which is connected to a respective point on the resistance line, with the cooperable load element connected to one of the two remaining transistor terminals, one of which also simultaneously forms the output of such voltage comparator, the other transistor terminal forming the second comparator input for such voltage comparator, respective transistor switches disposed at each end of the resistance line, one of which is operative to connect the signals to be converted to the resistance line, the second operative to connect a current generator to the other end of the resistance line, and each end of the resistance line having a respective switching transistor connected thereto comprising third and fourth transistors, for selectively connecting a voltage source across the resistance line, comprising the steps of placing the free ends of the load elements on a fixed potential, applying impulses to the second comparator inputs, operating the first and second transistors alternately with the third and fourth transistors whereby the first and second are conductive while the third and fourth are blocked and vice versa, applying said impulses to the second comparator inputs when said second and fourth transistors are conductive, and rendering such transistors nonconductive prior to the termination of the corresponding impulse, with the digital signals simultaneously appearing in parallel at the outputs of the voltage comparators.

4,180,807

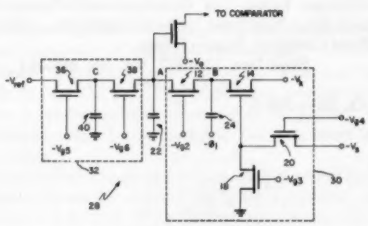
CHARGE TRANSFER CIRCUIT WITH VOLTAGE THRESHOLD COMPENSATING MEANS

Charles W. Eichelberger, Schenectady, and Walter J. Butler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,234

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 AD **5 Claims**



5. An analog to digital converter comprising:

means comprising a first capacitor for storing charge;

first charge supply means for supplying a succession of first packets of charge to said charge storage means, said first charge supply means including first and second MOSFETs having substantially similar electrical characteristics; another means comprising a second capacitor for storing charge; said first MOSFET being coupled between said first and second capacitors and said second MOSFET being coupled between said second capacitor and a potential well; and first biasing means for biasing said first MOSFET into a "shelf" transistor mode of operation during a first portion of each of a first one of two integration periods, said first biasing means biasing said first MOSFET in such a manner that the voltage across said second capacitor defines the source of said first MOSFET and said second capacitor charges through a value which is the function of the gate voltage of a first MOSFET less its threshold voltage; and second biasing means for biasing said second MOSFET into a "shelf" mode of operation during a second portion of each of a first of two integration periods, said second biasing means biasing said second MOSFET in such manner that the voltage across said second capacitor defines the sources of said MOSFET and said second capacitor charges to a level which is a function of the gate voltage of said second MOSFET

less the threshold voltage thereof, whereby said first and second MOSFETs cooperate to remove a discrete packet of charge from said first capacitor, with the magnitude of said first charge packets varying from a value proportional to the magnitude of an analog signal to be converted as a function of the difference between said threshold voltages of said first and second MOSFETs;

second charge supply means for supplying a succession of second packets of charge to said charge storage means, the magnitude of said second packets of charge being a constant, predetermined value, and the polarity of said second packets of charge being opposite to that of said first packets of charge;

control means for causing said first charge supply means to supply said succession of first packets of charge to said charge storage means during one of two integration periods wherein the charge stored in said charge storage means changes from a first to a second value, said control means also for causing a second charge supply means to supply said charge storage means with said succession of second charge packets during the other of said two integration periods wherein the charge stored in said charge storage means changes from said second to said first value; and

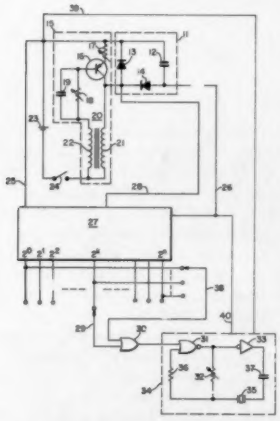
means for generating a digital signal which is the function of the ratio between the number of said first charge packets required to change the voltage across said charge storage means from said first to said second value and the number of said second charge packets required to change the voltage across said charge storage means from said second to said first value.

4,180,808

ALARM CIRCUIT

Jean-Philippe Lebet, Les Geneveys-sur-Coffrane, and Jean-Claude Droz, Neuchatel, both of Switzerland, assignors to The Gillette Company, Boston, Mass.

Filed Dec. 12, 1977, Ser. No. 859,343
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—384 E **5 Claims**



1. An acoustical alarm circuit comprising:

circuit means including a DC source for providing a low source of voltage and a self-starting voltage multiplier circuit, including a capacitor, for providing a higher source of voltage and for generating an input frequency signal;

counter means electrically connected to said circuit means and powered by said higher source of voltage for receiving said input frequency signal from said circuit means and for providing a plurality of fractional frequency outputs;

logic circuitry electrically connected to at least two of the fractional frequency outputs of said counter means for generating a modulated complex signal; and

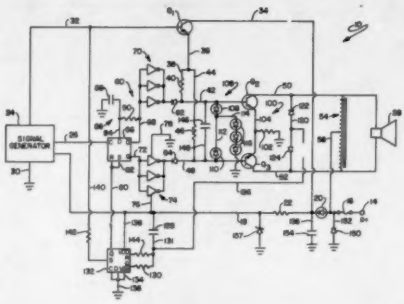
gated oscillator means including a sound generating transducer electrically connected to said circuit means and powered by said higher source of voltage and electrically connected to said modulated complex signal for providing an audible output signal.

4,180,809

ELECTRONIC SIREN

Robert S. Feldstein, Pelham Manor, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Jun. 16, 1978, Ser. No. 916,155
Int. Cl.[2] G08B *5/00*
U.S. Cl. 340—384 E **20 Claims**



1. In an electronic siren of a variety including a sound reproducing device representing a reactive load, first and second output transistor stages responsive to forward bias input signals for providing a square wave drive to said load and signal generating means for providing pulse train input signals, the improvement comprising:

solid state switching means for asserting said forward bias input signals at said first and second power transistor stages to effect a saturated on condition thereof; and

control network means coupled with said first and second output transistor stages, and with said signal generating means and responsive to said pulse train input signals for alternately diverting said forward bias input signals through a low impedance path from said first and second output transistor stages to effect said square wave drive, whereby thermally induced leakage currents are diverted in conjunction with said forward bias input signals.

4,180,810

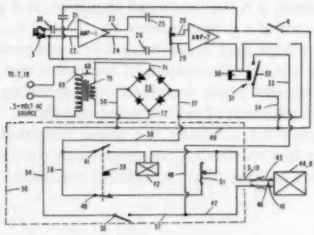
SILENT AWAKENING SYSTEM

Hrand M. Muncheryan, 1735 N. Morningside St., Orange, Calif. 92667

Filed Jan. 16, 1978, Ser. No. 869,797
Int. Cl.[2] G08B *1/08*
U.S. Cl. 340—407 **13 Claims**

1. A silent awakening system, comprising: a first means adapted to receive an acoustic signal and to convert said acoustic signal into an electrical signal, an electric amplifying means connected to said first means and having an electric circuit therein to amplify and transmit said electrical signal to an electric relay means for operation thereof, a second means, in electrical connection with said first means, receiving an alternating current from an external source and adapted to convert said alternating current into a direct current for energization of said first means, and a third electric circuit means connected to said second means to receive therefrom a direct current through said electric relay means therein to electrically process said direct current; said third electric circuit means having in the current-processing circuit thereof a current-interrupting

means, a variable current control means disposed therein in electrically parallel relation to said current-interrupting means, and a current-switching means, connected between the electrically parallel sections comprising said current-interrupting means and said variable current control means, to channel the direct current supplying said electrically parallel section into



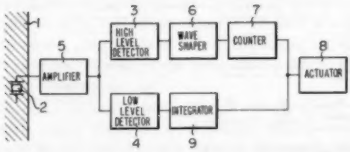
one or the other of said electrically parallel sections; and, an awakening module in electrical connection with said third electric circuit means through said current outlet means to receive an electric current therefrom for operation of said awakening module by the actuation of said electric relay means upon reception of an acoustic signal by said first means.

4,180,811

DETECTING DEVICE FOR DESTRUCTIVE VIBRATION OF STRUCTURES

Tadashi Yoshimura, Tsu; Tohru Hanahara, Hirakata; Toshio Abiko, Daito, and Kazuhiro Matsuoka, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 1, 1977, Ser. No. 802,580
Claims priority, application Japan, Oct. 22, 1976, 51-127488
Int. Cl.[2] G08B *13/04*
U.S. Cl. 340—566 **2 Claims**



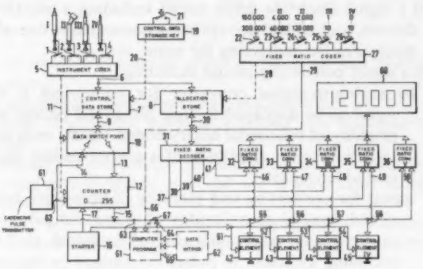
1. A detecting device for detecting vibration of structures comprising: a detecting element for detecting any vibration of the structure, an amplifier for amplifying output pulses from said detecting element, a high level detector for detecting and amplifying high level outputs of the output pulses from said amplifier, a counter which generates an output when a predetermined number of high level outputs from said high level detector are counted, a wave form shaping circuit including a time constant circuit inserted between said amplifier and said counter for shaping the outputs from the high level detector into a predetermined shape recognizable by the counter, a low level detector for detecting low level outputs of the output pulses from the amplifier, an integrating circuit to which an output of said low level detector is presented, an alarming circuit to which outputs of said integrating circuit and counter are presented; and a condenser charged by an output of said wave shaping circuit for releasing said counter from a reset state for a fixed time, said condenser being grounded when said alarming circuit receives an input signal so that the counter will be arbitrarily reset by a relay in said alarming circuit.

4,180,812

DENTAL TREATMENT APPARATUS

Kurt Kaltenbach, Biberach; Martin Saupe, Mittelbiberach; Stefan Beier, Biberach; Hermann Gmeinder, Biberach, and Hartmut Braetsch, Biberach, all of Fed. Rep. of Germany, assignors to Kaltenbach & Voight GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Mar. 31, 1978, Ser. No. 892,274
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715798
Int. Cl.[2] G06K *15/18*
U.S. Cl. 340—706 **13 Claims**



1. A dental treatment apparatus having a dental instrument, and a control and display arrangement for controlling the operation of the dental instrument and for displaying the magnitude of an operating parameter of the dental instrument, said control and display arrangement comprising:

a control data store for storing a pre-determined fixed control datum value for said operating parameter of the dental instrument;

a display device operable to display the magnitude of said operating parameter of the dental instrument;

control means connected to said control data store and operable to vary the pre-determined fixed control datum value to a further instantaneous value as desired, said instantaneous value being stored in the data store as a further value;

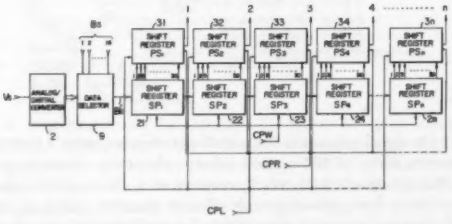
and a data converter connected to said control means and to said display device for converting the instantaneous value stored in the data store to a corresponding service datum instantaneous value to be displayed by said display device.

4,180,813

LIQUID CRYSTAL DISPLAY DEVICE USING SIGNAL CONVERTER OF DIGITAL TYPE

Yutaka Yoneda, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 26, 1977, Ser. No. 819,408
Int. Cl.[2] G06K *15/18*
U.S. Cl. 340—784 **3 Claims**



1. A liquid crystal display device for displaying a video signal, comprising:

(a) a liquid crystal display panel in which liquid crystal

picture elements are located at intersections of plural rows of scanning electrodes and plural columns of signal electrodes arranged in a matrix configuration, the transmissivity of said liquid crystal picture elements being selectively controlled when the associated scanning and signal electrodes are energized;

(b) a control circuit for generating a first, a second, and a third clock signal;

(c) ring counter means for producing a scanning signal in response to said first clock signal;

(d) means for energizing selected ones of said scanning electrodes in response to said scanning signal;

(e) a signal electrode drive circuit including a plurality of drivers, each of said drivers being connected to one of said electrodes for energizing the same; and

(f) a signal converting circuit including:

an analog-to-digital converter for converting a video signal to be displayed for one horizontal period into a plurality of time-serial binary-coded signals each corresponding to an amplitude of a corresponding part of said video signal;

means for converting said plurality of time-serial binary-coded signals into a plurality of time-serial pulse trains in accordance with said second clock signal, each train including a number of pulses determined by the corresponding binary-coded signal;

a plurality of first shift registers connected in series for storing said plurality of time-serial pulse trains; and

a plurality of second shift registers, each first shift register being connected to one of said second shift registers, for storing the contents of said first shift registers at a time in response to said first clock signal and, each of said second shift registers being connected to one of said drivers correspondingly and respectively, for supplying said time-serial pulse trains to the same in accordance with said third clock signal.

4,180,814

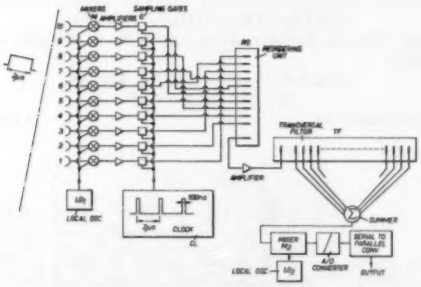
MULTIPLE BEAM RECEIVING ARRAY SIGNAL PROCESSOR

Paul Barton, Bishops Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,607

Int. Cl.[2] G01S *3/14, 9/02*

U.S. Cl. 343—5 DP **5 Claims**



1. A signal processor for a multiple element radar receiving antenna array of N-1 spaced antenna elements, comprising:

N-1 mixers each discretely responsive to the received signal on a corresponding one of said antenna elements, said mixers operating against a local oscillator frequency offset by a predetermined amount from the radio frequency of said received signals to generate N-1 intermediate frequency signals;

means for sampling said N-1 intermediate frequency signals periodically and simultaneously to provide N-1 sample signals:

a phase weighted transversal filter and means for transferring said sample signals serially to said filter in a sequence which is a reordering of the linear phase sequence of said antenna elements according to the prime number transform algorithm $p=g^i$ modulo N, where i is the original sequence, p is the reordered sequence, and g is the primitive root of a prime number N;

means within said transversal filter comprising a tapped delay line with the outputs of successive taps thereof being individually phase weighted corresponding to the reordered sequence of said sampled signals;

and means for summing the phase weighted taps of said delay line to effect a convolution of the input signal sequence and the phase weighting sequence.

4,180,815

RADIO IDENTIFICATION SYSTEMS

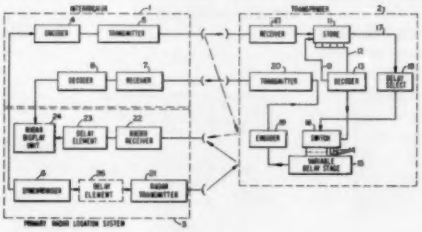
Orvin G. Hill, Malvern, England, assignor to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, United Kingdom

Filed Jan. 20, 1978, Ser. No. 871,002

Claims priority, application United Kingdom, Jan. 24, 1977, 2751/77

Int. Cl.[2] G01S *9/56*

U.S. Cl. 343—6.5 R **8 Claims**



1. A transponder for use in a radio identification system comprising:

a receiver for receiving interrogating signals transmitted from an interrogating station;

processing means for processing the received interrogating signals to produce reply signals in response thereto;

a transmitter for transmitting said reply signals;

storage means for temporarily storing a new interrogating signal received while the processing means is occupied in processing a previously received interrogating signal, at least until the processing means is capable of independently processing the new interrogating signal; and

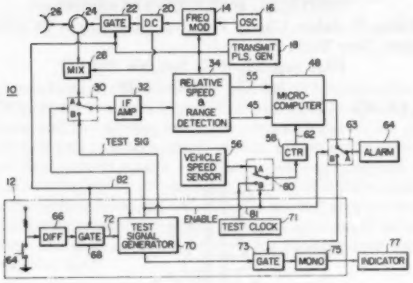
variable delay means arranged to delay the transmission of the reply signal to each received interrogating signal by an amount inversely dependent upon the length of any delay introduced by storage of the interrogating signal in the said storage means, so that the overall delay between the reception of an interrogating signal and the transmission of a reply signal thereto is substantially constant for any interrogating signal.

4,180,816

TESTING CIRCUIT FOR RADAR-OPERATED VEHICLE SAFETY ASSURANCE SYSTEMS

Hiroshi Endo, Yokosuka, and Norio Fujiki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 29, 1978, Ser. No. 937,763
Claims priority, application Japan, Aug. 29, 1977, 52-102642
Int. Cl.[2] G01S 7/40
U.S. Cl. 343—7 VM 9 Claims



1. A testing circuit for a radar-operated safety assurance system for a roadway vehicle including means for transmitting a train of microwave burst energy and receiving a return signal from a target, means for mixing the return signal with a locally generated signal to derive an intermediate frequency return signal, means for sensing the roadway speed of said vehicle, relative speed detecting means for deriving the speed of said vehicle relative to said target from said intermediate frequency return signal, range detecting means for deriving the range of said target from said intermediate frequency return signal, and a decision making circuit responsive to said sensed vehicle roadway speed, said derived relative vehicle speed and said derived range of the target to determine a safety distance to said target, comprising:

means for generating an artificial intermediate frequency return signal from a hypothetical target, said artificial return signal comprising a train of intermediate frequency burst signals which occur at intervals that decrease as a function of time;

means for generating a signal indicative of a predetermined vehicle roadway speed;

means for switching said radar system in response to a manual command from a normal operating mode to an under-test mode in which said relative speed detecting means and said range detecting means are receptive of said generated artificial intermediate frequency return signal and said decision making circuit is receptive of said generated predetermined vehicle roadway speed indicative signal, whereby said decision making circuit determines a safety distance to said hypothetical target and generates an output signal when the instantaneous value of the distance to said hypothetical target derived by said range detecting means corresponds to said determined safety distance to said hypothetical target; and

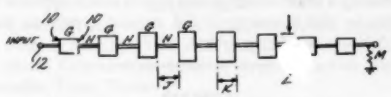
means for determining whether said output signal from said decision making circuit occurs within a predetermined time interval.

4,180,817

SERIALLY CONNECTED MICROSTRIP ANTENNA ARRAY

Gary G. Sanford, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed May 4, 1976, Ser. No. 683,203
Int. Cl.[2] H01Q 1/38, 3/26
U.S. Cl. 343—700 MS 35 Claims



1. A microstrip antenna array of radiating slot apertures comprising:

an electrically conductive reference surface;

a layer of dielectric material overlying said reference surface;

a plurality of electrically conductive radiator surfaces overlying said dielectric material and spaced apart along a predetermined path,

each of said radiator surfaces defining at least one radiating slot aperture between an edge thereof and the underlying reference surface,

each of said radiator surfaces having an effective substantially one-half wavelength dimension transverse to said radiating slot aperture at the anticipated antenna operating frequency,

said radiating slot apertures extending along the edges of the radiator surfaces being disposed transversely of said predetermined path,

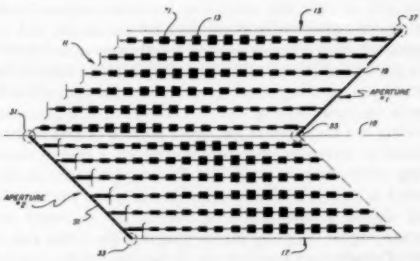
strip transmission line means overlying said dielectric material and interconnecting said radiator surfaces in series along said predetermined path so as to conduct radio frequency energy to/from said radiating slot apertures and a common feed point for the antenna array.

4,180,818

DOPPLER NAVIGATION MICROSTRIP SLANTED ANTENNA

Leonard Schwartz, Montville, N.J.; Edward Chin, New York, and Emile J. Deveau, Pleasantville, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Feb. 13, 1978, Ser. No. 876,973
Int. Cl.[2] H01Q 1/28
U.S. Cl. 343—700 MS 9 Claims



1. In a planar antenna, adapted for use in Doppler navigation, the antenna aperture slanted such as to obtain a beam shape which essentially eliminates over-water shift, the antenna being made up of two groups of arrays, the first of which is adapted to generate one set of diagonal beams forward and to the left and aft and to the right and the second of which is adapted to generate another set of diagonal beams forward to the right and aft and to the left, a method of providing fore-aft frequency compensation comprising constructing each array in

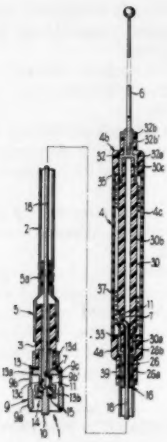
said first group of arrays from a plurality of elements in series, said elements electrically spaced apart in such a manner so as to obtain phase shifts therebetween which will result in an array which has a beam pointing in the direction in which input energy is fed to form forward firing arrays and constructing the arrays of said second group of arrays from a plurality of elements in series electrically spaced apart so as to establish a phase difference between successive elements which will result in generating a beam which points in a direction opposite to the direction in which energy is fed to said arrays to thereby establish backward firing arrays.

4,180,819

DIPOLE ANTENNA STRUCTURE

Masao Nakano, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Jul. 5, 1977, Ser. No. 812,572
Int. Cl.[2] H01Q 9/16
U.S. Cl. 343—792 **4 Claims**



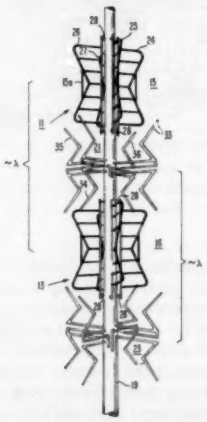
1. A vertical dipole antenna structure comprising, in combination: a vertically extending connector at the bottom of the structure and having a pair of downwardly extending connector elements adapted to interfit with complementary upwardly extending connector elements of a support for the antenna structure, a vertically extending insulating sleeve having its bottom portion rigidly connected to the upper end of said connector and its upper portion rigidly connected to the bottom portion of a vertically extending dipole element-forming sleeve, an insulating housing secured to the upper end of said dipole element-forming sleeve, a conductive dipole element-forming rod anchored at the upper portion of said housing and extending vertically upwardly therefrom, a pair of signal carrying conductors having their lower ends respectively connected to said pair of connector elements and passing through said dipole element-forming sleeve in insulated relation thereto, signal coupling means coupling the other end of said pair of conductors respectively to the inner ends of said dipole element-forming sleeve and rod, said insulating housing having bottom and intermediate portions and a cap portion, a coil support bobbin in said housing on the outside of which bobbin are coils of wire forming said signal coupling means, the bobbin terminating in a conductive end portion at the bottom end thereof to which the upper end of said dipole element-forming sleeve and said coils are physically and electrically connected, the upper end of said bobbin having a conductive end portion thereon to which said dipole element-forming rod and coils are physically and electrically connected, and said cap portion being threadedly securable at the upper portion of said bobbin so as to hold together the assembly of said bobbin and the bottom and intermediate portions of said housing.

4,180,820

CIRCULARLY POLARIZED ANTENNA SYSTEM USING A COMBINATION OF HORIZONTAL AND BENT VERTICAL DIPOLE RADIATORS

McKinley R. Johns, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,157
Int. Cl.[2] H01Q 21/26
U.S. Cl. 343—798 **6 Claims**



1. A circularly polarized antenna system comprising:

a vertically oriented support mast,

a first system of four horizontal radiating elements mounted about the mast at 90° intervals with the elements extending from the mast and configured to excite horizontally polarized fields,

means for feeding signal energy to said four horizontal radiating elements in relative phase rotation of 0°, 90°, 180° and 270°,

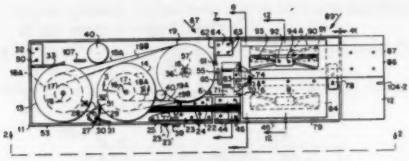
a second system of four vertically oriented dipoles mounted to the mast a given vertical distance from said first system, said vertically oriented dipoles being electrically substantially greater than a half wavelength and being configured to present the aperture of a half wavelength dipole, said vertically oriented dipoles each comprising a pair of vertically extending dipole arms with each arm having a bend near the midpoint of said arm for reducing unwanted radiation above and below said dipole,

means for feeding signal energy to each of said four vertically oriented dipoles in relative phase rotation of 0°, 90°, 180° and 270°, said second system of four vertically oriented dipoles being spaced from each other and fed in amplitude and phase relationship with respect to said first system of four horizontal radiating elements to cause the horizontal pattern of the vertically polarized field associated with the vertical dipoles to be of similar shape and magnitude and in phase quadrature to the horizontal pattern of the horizontally polarized field associated with the four horizontal radiating elements.

4,180,821
MOTION TAPE RECORDER

Richard H. Prewitt, Jr., P.O. Box 532, Lexington, Ky. 40501, and Richard H. Prewitt, 1634 N. Broadway, Lexington, Ky. 40505

Filed Oct. 14, 1975, Ser. No. 622,230
Int. Cl.[2] G01D *9/00, 15/16, 15/24;* G03B *1/04*
U.S. Cl. 346—7 22 Claims

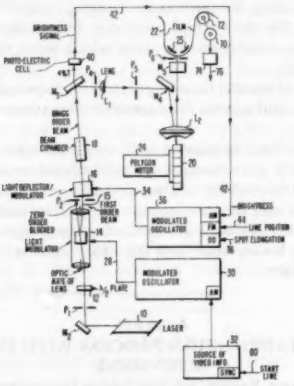


1. A mechanical tape recording instrument having a first and second support means; a tape; a first and second tape support reel mounted for moving said tape perpendicular to the plane of said first and second support means; a tape guide mounted on said first support means; a marking point engaging said tape and mounted to move in a substantial transverse plane relative to the movement between said first and second support means, and flat spring member means activated by movement between said first and second support means for rotating said second tape support reel.

4,180,822
OPTICAL SCANNER AND RECORDER

Kenneth C. Hudson, Philadelphia, Pa., and Donald G. Herzog, Collingswood, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 896,034
Int. Cl.[2] G01D *15/14*
U.S. Cl. 346—108 7 Claims

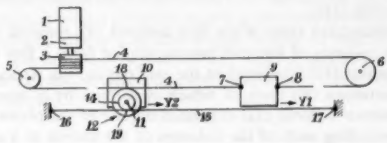


1. An optical scanner, comprising
means in a light beam path including an acoustooptic light deflector/modulator and a deflector to cause a light beam to scan a line on a target,
an electrical oscillator having an amplitude modulation input and a frequency modulation input and producing electrical oscillations coupled to said light deflector/modulator,
a photo-electric cell positioned to receive a portion of the light in the beam, and having an electrical output coupled to the amplitude modulation input of said light deflector/modulator to effect an automatic brightness control of the beam,
an array of photo-electric cells positioned to receive light from the scanned beam, and
an electrical circuit responsive to the outputs of the array of photo-electric cells and having an output coupled to the frequency modulation input of the light deflector/modulator to effect an automatic line scan spacing control of the beam.

4,180,823
CONTROL DEVICE FOR CONTROLLING THE MOVEMENTS OF TWO CARRIAGES OF A DUPLEX RECORDER

Pierre Guyot, Franconville; Alain Coty, Sagy, and Paul Delfau, Les Puits la Marliere-Villiers le Bel, all of France, assignors to Societe Commerciale Chauvin Arnoux Societe Anonyme Francaise, Paris, France

Filed Nov. 29, 1978, Ser. No. 964,748
Claims priority, application France, Dec. 2, 1977, 77 36258
Int. Cl.[2] G03D *15/16*
U.S. Cl. 346—139 B 6 Claims

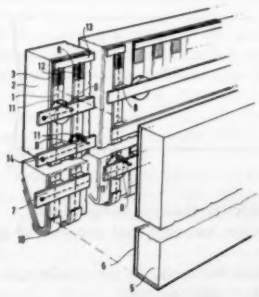


1. A control device for controlling the movements of first and second recording means support-carriages of a two-carriage duplex recorder, comprising a flexible elongated traction means connected to said first carriage, and drive means associated with said traction means for moving said first carriage selectively in two opposite directions, wherein coaxial first and second wheels are mounted for rotation as a unit on said second carriage about an axis at right angles to said two opposite directions, said first wheel being in driving relationship with said traction means so as to be rotatively driven thereby, and an elongated fixed reaction member extending in a parallel direction to said two opposite directions and being in engagement with said second wheel to cause the latter and said second carriage to move along said reaction member upon rotation of said first and second wheels.

4,180,824
HEAD FOR ELECTRICALLY PRINTING AN IMAGE

Marcel Yvard, Ollainville; Jean-Claude Decuyper, Elancourt, and Michel Beduchaud, Villebon sur Yvette, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 9, 1978, Ser. No. 914,179
Claims priority, application France, Jun. 13, 1977, 77 18012
Int. Cl.[2] G01D *15/06;* G03G *15/044;* B41J *3/04;* H04N *1/22*
U.S. Cl. 346—154 6 Claims



1. A bar for printing an image on a sensitive paper by scan-

ning the paper along successive lines, comprising a plurality of printing styli aligned along the length of the scan line, and comprising n square matrices for addressing the styli, the matrices being formed by a first network of electrically conductive tapes which are insulated from one another and are divided into n identical sets of conductors and each of which has one end connected to a respective stylus, and by a second network of electrically conductive tapes perpendicular to the first network and having as many tapes as there are conductive tapes in each set of the first network and selectively connected to the conductive tape of the first network to form the said n matrices, characterized in that the first network and the second network of conductive tapes (**1, 7**) are formed respectively on a first insulative plate (**3,4**) and on a second insulative plate (**6**), and are disposed on the interior faces of the plates when assembled together and are isolated from each other at the intersections between conductive tapes except for the selective connections for forming each of the said matrices and in that for each matrix (**21**):

the conductive tapes of the first network (**1**), referred to as the columns of the said matrix, are fed from a first feed terminal (**17**) attributed to the said matrix, via respective resistances (R) each of which is formed by a layer of resistive material (**12**) deposited on one of the plates and connecting each of the columns of the matrix to a common conductive strip (**13**) formed on the other plate and insulated from the tapes of the said other plate and electrically connected to the said first terminal,

the conductive tapes of the second network (**7**), referred to as the rows of each matrix, are individually controlled from respective second feed terminals (**14**) and are selectively connected to the columns via diodes (D) each formed by a pellet of semi-conductive material (**11**) which is mounted on one of the two plates defining the row and the column in question at their intersection.

4,180,825

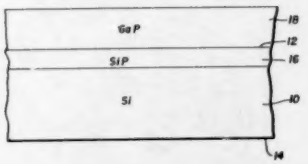
HETEROEPITAXIAL DEPOSITION OF GAP ON SILICON SUBSTRATES

Donald R. Mason, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 833,935, Sep. 19, 1977, Pat. No. 4,120,706. This application May 31, 1978, Ser. No. 911,557

Int. Cl.[2] **H01L** *29/161*

U.S. Cl. 357—16 **7 Claims**



1. A semiconductor structure comprising:

a silicon substrate having a first and second surface in the (111) plane;

said first surface being silicon phosphide to a depth in the range of 2 to 8 microns; and

an epitaxial layer of gallium phosphide on said first surface having a thickness of up to eight microns without cracks.

4,180,826

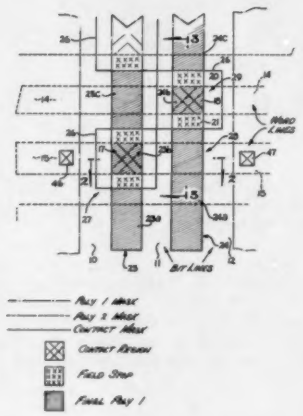
MOS DOUBLE POLYSILICON READ-ONLY MEMORY AND CELL

Joseph Shappir, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed May 19, 1978, Ser. No. 907,557

Int. Cl.[2] **H01L** *27/04*

U.S. Cl. 357—41 **11 Claims**



1. MOS memory cells for a read-only memory which store binary data, said cells formed on a silicon substrate, comprising:

a pair of spaced-apart, elongated doped regions formed in said substrate, said doped regions forming source and drain regions for said cells;

a first line of polysilicon insulated from said substrate extending generally between said doped regions, said first line including discontinuities forming isolated sections of said line for cells which store one binary state, said first line being continuous for cells which store the other binary state;

a plurality of second lines of polysilicon disposed above said first line, said second lines generally transverse to said first line;

said second lines associated with said cells which store said one binary state contacting said isolated sections of said first line to provide contact to said isolated sections, the others of said second lines insulated from said first line;

whereby memory cells are formed, some programmed with said one binary state and the other cells with the other binary state.

4,180,827

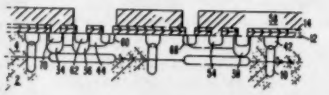
NPN/PNP FABRICATION PROCESS WITH IMPROVED ALIGNMENT

Harlan R. Gates, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1977, Ser. No. 830,222

Int. Cl.[2] **H01L** *27/02*

U.S. Cl. 357—44 **2 Claims**



1. A lateral PNP bipolar transistor structure, comprising:

an epitaxial layer of a first conductivity type over a buried sub-base region of said first conductivity type;

a collector region of a second conductivity type formed in the surface of said epitaxial layer over said buried sub-base region;

a base region of said first conductivity type formed over said collector region through a mask window and projecting through said collector region into said epitaxial layer and electrically contacting said sub-base region;

an emitter region of said second conductivity type formed within said base region through said mask window, defining an intrinsic lateral base region between the lateral sides of the emitter region and the base region;

a base contact on the surface of said epitaxial layer for making electrical contact with said base region;

whereby a lateral PNP is formed with a reduced collector to base capacitance.

4,180,828

HYBRID CIRCUIT HAVING A SEMICONDUCTOR CIRCUIT

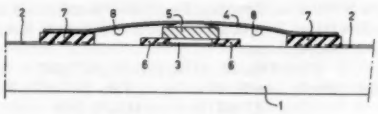
Gijsbertus J. H. Schermer; Hubertus H. A. Winters; Willem C. Hildering, and Karl F. Nickl von Nikelsberg, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,070

Claims priority, application Netherlands, Feb. 5, 1977, 7704773

Int. Cl.[2] H01L *23/42*

U.S. Cl. 357—79 **4 Claims**



1. A hybrid circuit comprising

an insulating substrate having a plurality of conductors formed on a surface thereof,

a semiconductor circuit provided on said substrate surface and including a semiconductor element and an insulating flexible foil connected to said semiconductor element at a side remote from said substrate, said foil having conductor tracks associated with said substrate conductors,

spacers including first spacers on said substrate surface with said semiconductor element bearing thereon, and second spacers provided between adjacent ones of said substrate conductors with side edges of said foil bearing thereon,

connecting material filling the space between said semiconductor element and said substrate surface, and

conducting material filling the spaces between said second spacers to connect said foil conductor tracks and said substrate conductors.

4,180,829

TELEVISION SIGNAL PHASE MATCHING APPARATUS AND METHOD

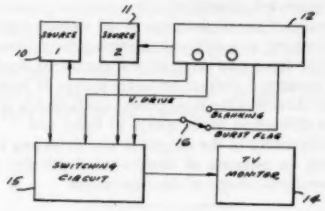
H. George Pires, Parlin, N.J., assignor to Crosspoint Latch Corp., Summit, N.J.

Filed Nov. 25, 1977, Ser. No. 855,006

Int. Cl.[2] H04N *9/62*

U.S. Cl. 358—10 **15 Claims**

1. In a television system having means for furnishing a first and second television signal each having video information signals adapted for display as a sequence of successive fields and each having synchronizing signals, and display means for furnishing a display having predetermined characteristic varying as a function of the phase of signals applied to said display means, a method for furnishing a visual indication of phase difference between said synchronizing signals of said first and second television signals, comprising, in combination, the steps of applying said synchronizing signals of said first television signal to said display means during a first predetermined part of each of a plurality of sequential time intervals; and blocking the application of said synchronizing signals of said first television signal to said display and applying instead the synchronizing signals of said second television signal during a second predetermined part of each of said time intervals, said sequential time intervals having a duration such that changes of said predetermined characteristic of said display caused by changing from said synchronizing signals of said first to said synchronizing signals of said second television signal cause visible changes in said display.



4,180,830

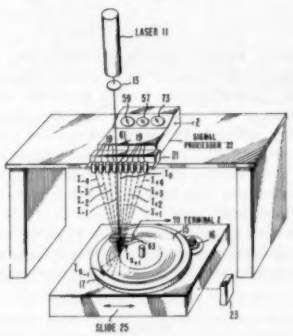
DEPTH ESTIMATION SYSTEM USING DIFFRACTIVE EFFECTS OF THE GROOVES AND SIGNAL ELEMENTS IN THE GROOVES

William R. Roach, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,735

Int. Cl.[2] G01N *21/32;* **G11B** *11/00;* **H04N** *5/76*

U.S. Cl. 358—128 **11 Claims**



1. Apparatus, for use with a flat surface which is regularly grooved with groove segments of substantially sinusoidal cross-sectional shape, for estimating groove depth; said apparatus comprising:

means for illuminating a region of the grooved surface, the illuminated region being sufficiently large to span a plurality of groove segments; the structure of the groove segments in the surface region illuminated serving as a diffraction grating for diffracting light reflected from said illuminated region to form respectively separated diffraction order beams of light;

means for detecting the light power contained in each of a plurality of said diffraction order beams of light;

means, coupled to the output of said detecting means, for deriving a groove depth estimate as a ratio of the square root of the light power of an nth order diffraction beam multiplied by 2n over the sum of the square roots of the light powers of respective n−1th and n+1th order diffraction beams.

10. Apparatus, for use with a flat surface which is regularly

grooved with groove segments and which is provided with successively spaced apart depressions of a given cross-sectional shape formed in the grooves, for estimating depression depth; said apparatus comprising:

means for illuminating a region of the grooved surface, the illuminated region being sufficiently large to span a plurality of groove segments;

the structure of the depressions in the surface region illuminated serving as a diffraction grating for diffracting light reflected from said illuminated region to form respectively separated diffraction order sprays of light;

means for detecting the light power contained in at least two of said diffraction order sprays of light; and

means, responsive to the output of said detecting means, for deriving an estimate of depression depth for the given cross-sectional shape of the depression.

4,180,831

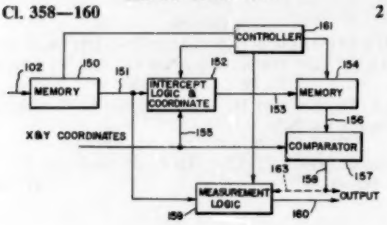
IMAGE ANALYSIS DATA EXTRACTION

Roger R. A. Morton, Penfield, and Cornelius J. D. McCarthy, Fairport, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 580,392, May 23, 1975, Pat. No. 4,115,804. This application Aug. 3, 1977, Ser. No. 821,368

Int. Cl.[2] H04N *5/14*

U.S. Cl. 358—160 **2 Claims**



1. An image analysis system for extracting data from an image by scanning a field of view, comprising:

keyboard control means having keys for controlling the operation of the system by a key sequence of operation whereby when keys, of said keys for controlling, are keyed sequentially, an image analysis data extracting operation, to be carried out by the image analysis system as a function of the keys keyed and the sequence of keying, is prescribed; and

display means associated with the keyboard control means for identifying the function of the keyed keys which function is determined by the keys and the sequence.

4,180,832

VIDEO RECORDING AND REPRODUCING APPARATUS HAVING VARIABLE REPRODUCTION SPEEDS

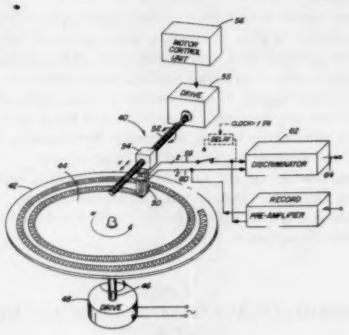
James A. Bixby, San Diego, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,674

Int. Cl.[2] H04N *5/78;* **G11B** *5/012, 21/08*

U.S. Cl. 360—10 **16 Claims**

1. A television video signal recording and reproduction system for use with a magnetic storage medium comprising first and second magnetic head means for recording said television signal on said storage medium and for reproducing said recording signal, means for rotating said storage medium at a rate such that one video image is recorded during one rotation of said storage medium, means for simultaneously moving said head means during recording relative to said storage medium such that said first head means records said video signal in a track formed as a continuous spiral on said storage medium and having a substantially unrecorded portion continuously adjacent said recorded track and for simultaneously moving both said head means during reproduction such that both said head means may register with different parts of said recorded track, whereby said head means reproduce discrete signals corresponding to those portions of said recorded track in registration therewith, and means connected to said head means for selecting portions of said signals to form therefrom an output signal representing said recorded television video signal.



4,180,833

APPARATUS AND METHOD FOR REPRODUCING VIDEO SIGNALS

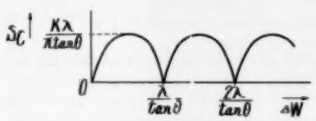
Masaru Nishikawa, Kounosu; Toshihiko Numakura, Kamakura, and Jun Hirai, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 877,867

Claims priority, application Japan, Feb. 24, 1977, 52-19479

Int. Cl.[2] G11B *5/02;* **H04N** *5/78*

U.S. Cl. 360—21 **5 Claims**



1. An apparatus for reproducing video signals recorded on a record medium in successive parallel record tracks which abut along their longitudinal edges and in which the recorded video signals include information and synchronizing signal portion modulating a carrier, a first set of said record tracks being comprised of every other one of the latter and having video signals recorded therein at a first azimuth angle which is different from a second azimuth angle with which video signals are recorded in the remaining tracks constituting a second set of record tracks, and said synchronizing signal portions of the video signals, as recorded in adjacent tracks, are out of alignment with each other; said apparatus comprising:

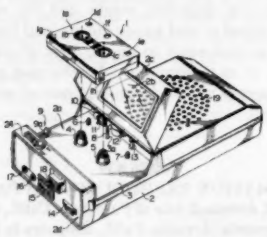
first and second magnetic heads for sequentially scanning tracks of said first and second sets of tracks, respectively, said first and second magnetic heads having azimuth angles corresponding to said first and second azimuth angles of the respective tracks to be scanned thereby, and each of said heads being dimensioned and guided in the direction transverse to that along the track being scanned so as to span the full width of the track being scanned and to overlap an adjacent track by a distance $\Delta W = n\lambda/\tan\theta$ ($n = 1, 2, \ldots$), wherein λ is the wavelength of the carrier as modulated by said synchronizing signal portions of the video signals in said adjacent track and θ is the difference between said first and second azimuth angles of said heads, so as to substantially attenuate the most troublesome of the cross-talk from said adjacent track.

4,180,834

HEAD MOUNTING DEVICE FOR TAPE RECORDER

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Division of Ser. No. 794,065, May 5, 1977. This application Sep. 1, 1977, Ser. No. 829,594
Claims priority, application Japan, May 11, 1976, 51/59249
Int. Cl.[2] G11B 5/56
U.S. Cl. 360—109 3 Claims



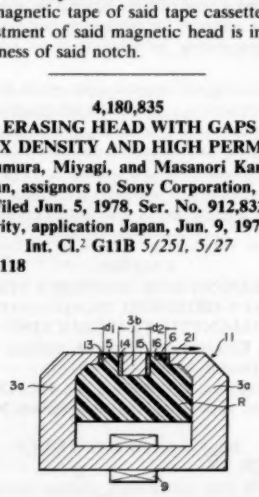
1. A magnetic head mounting device for adjusting the position of a magnetic head of a small size tape recorder wherein record and playback are performed by moving a surface of the magnetic head into a tape cassette disposed in a cassette receiving region of the tape recorder, said tape recorder including operating buttons, a head support plate having a planar portion within a segment thereof cut away to form a notch, means for pivotally mounting said head support plate for rotation by actuating said operating buttons, a head mounting plate having a planar portion in which one end is fixedly mounted on said head support plate and the opposite end formed to define an outwardly extending portion parallel to said last-mentioned planar portion, said magnetic head fixedly mounted on said planar portion of said head mounting plate for adjustment therewith, and means cooperating with said head support plate and said extending portion for adjusting the position of said head mounting plate with said magnetic head relative to and into said notch to adjust the azimuth of the magnetic head relative to a magnetic tape of said tape cassette whereby the range of adjustment of said magnetic head is increased by at least the thickness of said notch.

4,180,835

MAGNETIC ERASING HEAD WITH GAPS UTILIZING HIGH FLUX DENSITY AND HIGH PERMEABILITY

Haruhiko Okumura, Miyagi, and Masanori Kanaya, Tagajyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 5, 1978, Ser. No. 912,832
Claims priority, application Japan, Jun. 9, 1977, 52-68317
Int. Cl.[2] G11B 5/251, 5/27
U.S. Cl. 360—118 5 Claims



1. A magnetic erasing head for erasing recorded signals on a magnetic recording medium which is facing to the front surface of said magnetic erasing head, comprising:

(A) first, second and third core elements made of ferrite;

(B) first and second gaps formed between said first and second core elements, and between said second and third core elements, respectively, facing toward said magnetic recording medium;

(C) one or more magnetic material layers having higher magnetic flux density and higher permeability than the magnetic flux density of said ferrite core elements mounted in said first and second gaps, respectively, said layers having magnetic flux density B_{10} of more than 5000 gauss, permeability μ of more than 5000, and thicknesses of 5 to 30μ in the lengthwise direction of said gaps; and

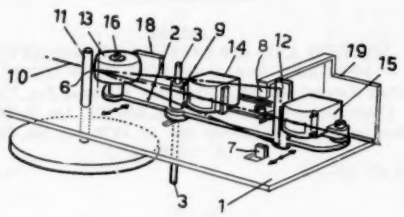
(D) a winding provided around at least one of said core elements to generate magnetic flux in said core elements by an application of AC current.

4,180,836

POSITIONING DEVICE OF PLAY-BACK HEADS AND PRESSING DEVICES IN PLAY-BACK AND/OR RECORDING APPARATUS

Rodolfo Cicatelli, Gandria, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 720,400, Sep. 3, 1976, abandoned. This application May 30, 1978, Ser. No. 910,324
Int. Cl.[2] G11B 15/29
U.S. Cl. 360—130.32 7 Claims



1. A device for positioning play-back heads and pressing devices (pressure rollers) in a band (tape) play-back and/or recording apparatus having a frame, said device comprising:

at least one play-back head and at least one pressure roller affixed on a rigid support which is movable into a working (play) position with respect to said frame, wherein said pressure roller contacts a capstan shaft with tape being driven therebetween in said working position;

said support being movable relative to first block elements which are fixed with respect to said frame, said first block elements determining the working position for said support carrying said play-back head and said pressure roller by forming three points of contact with second elements that are rigidly affixed to said support, said contact points corresponding to the vertices of a triangular configuration, two of said three points of contact effectively forming a hinge axis for said support about which said support can rotate as it is moved into its working position;

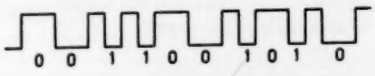
a pin which is located between said two vertices forming said hinge axis and the third vertex, said pin being coupled to and movable with said support and permitting free movement of said support about said pin; and

means coupled to said pin for moving said pin and said support into said working position in a trajectory substantially orthogonal to the plane of movement of the band (tape).

4,180,837
MAGNETIC CODING METHOD

André Michaud, Chatenay Malabry, France, assignor to Transac - Compagnie pour le Developpement des Transactions Automatiques, Paris, France

Filed Mar. 22, 1978, Ser. No. 889,083
Claims priority, application France, Mar. 25, 1977, 77 08963
Int. Cl.[2] G11B *5/02*; G06K *19/06*; G11B *5/09, 25/04*
U.S. Cl. 360—18 **3 Claims**



1. A method of coding and recording two independent messages on a single magnetic track of polymerizable ink having particles with a privileged direction of magnetization corresponding to their largest dimension, each message being in the form of a binary number; the method comprising the following steps:

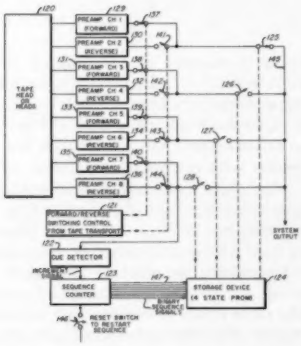
recording the first message by subdividing the track into successive zones of length a or a/2 chosen according to the bits of the message, imparting one of two different magnetic orientations to the particles of the polymerizable ink in alternate zones, and immobilizing the oriented particles by polymerizing the ink; and

recording the second message in terms of magnetic moment having a usable component parallel to the axis of the track on said oriented particles in a double frequency code at a frequency such that one binary digit is written in each of the zones of length a/2 of the track and two binary digits are written in each of the zones of length a.

4,180,838
METHOD AND APPARATUS FOR PRODUCING PROGRAMMABLE SELECTION OF MUSIC

William Fehrenkamp, 8826 Bissonnet, Houston, Tex. 77074

Continuation-in-part of Ser. No. 866,779, Jan. 3, 1978, abandoned. This application Apr. 10, 1978, Ser. No. 894,920
Int. Cl.[2] G11B *15/12*
U.S. Cl. 360—63 **14 Claims**



1. Apparatus for producing programmable selections of music, comprising:

a prerecorded media having a plurality of channels recorded thereon and having program breakpoint alignment;

means for detecting and reproducing musical selections recorded in each of said plurality of channels and having multiple output capability;

means for providing motion of said media past said detecting means said motion providing means being dynamically operable at essentially only a single preselected speed of motion;

a plurality of gating means connected to said detecting and reproducing means for selecting a channel for output, said gating means being responsive to a selection signal;

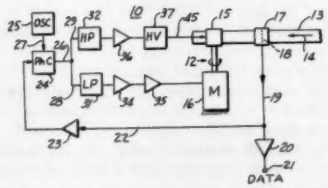
cue detecting means for detecting a cueing condition and for generating an output signal in response thereto; and

selection signal generating means including a programmable memory means having a predetermined number of memory locations, said locations having contents at least equal to the number of said plurality of channels, so as to generate a selection signal upon receipt of said output signal from said cue detecting means and for supplying said selection signal to said gating means; said locations having contents at least equal to the number of said plurality of channels, so as to generate whereby said programmable memory means selects for output one of said plurality of channels.

4,180,839
INFORMATION REPRODUCING APPARATUS

Joseph J. Neff, deceased, late of Pasadena, Calif., and by Lucille D. Neff, executrix, Arcadia, Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Apr. 5, 1977, Ser. No. 784,759
Int. Cl.[2] G11B *15/18, 17/00, 21/02*
U.S. Cl. 360—71 **24 Claims**



1. In apparatus for reproducing information from an information carrying tape, the improvement comprising in combination:

means including a tape capstan having an annular layer of piezoelectric material for advancing said tape;

means for reproducing information from said advancing tape;

means connected to said reproducing means for detecting a flutter component in reproduced information; and

means connected to said detecting means and operatively associated with said layer of piezoelectric material for varying the diameter of said annular layer of piezoelectric material in response to said detected flutter component in the sense of a reduction of said flutter component.

4,180,840
CLEANING DISK ASSEMBLY FOR OPPOSITELY-ORIENTED, DUAL-COMPONENT MAGNETIC TRANSDUCERS

James C. Allan, Kinnesswood, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 9, 1978, Ser. No. 914,113
Claims priority, application United Kingdom, Mar. 29, 1978, 12162/78
Int. Cl.[2] G11B *5/41, 25/04*
U.S. Cl. 360—128 **2 Claims**

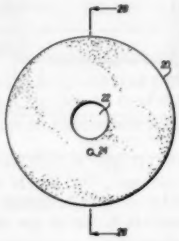
1. In a flexible disk information storage system having an access arm which includes two oppositely-oriented transducer and pressure pad pairs, where each pair includes both a magnetic transducer for writing and reading information on one side of the disk and a pressure pad applied to the other side of the disk for increasing the loading of the corresponding transducer against the normally-flexible surface, and where the engagement with the disk surface by each transducer and associated pressure pad is selectively controlled by signals

generated within the storage system, apparatus for separately cleaning both of the magnetic transducers comprising:

A. cleaning disk means, for providing an abrasive first surface on which each transducer can be cleaned, and for providing a non-abrasive second surface as a standard operational substrate onto which the corresponding pressure pad can be applied without pad damage while each transducer is being cleaned;

B. disk cartridge means, for enclosing said cleaning disk means, for enabling said cleaning disk means to be reversibly mounted in the disk drive unit of the information storage system, and for enabling the drive unit to engage and rotate said cleaning disk means in either of its reversible orientations;

C. movement-free abrasion-orientation means, located in said disk cartridge means, for enabling said information



storage system to automatically determine, for either orientation of said cartridge means, the side of said cartridge means on which said abrasive surface is located, so that, regardless of the cartridge means orientation, said system can command only the transducer which is adjacent said abrasive surface to engage said surface; and

D. arm access means, located in said disk cartridge means, for enabling, upon appropriate command from said storage system, each transducer and the corresponding pressure pad to pass through said disk cartridge means and make contact with said abrasive first surface and with said non-abrasive second surface respectively, when said cartridge means is mounted in the information storage system;

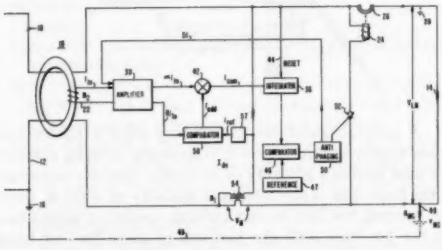
whereby either transducer can be cleaned on said abrasive surface without danger of damaging either of the pressure pads by loading them onto said abrasive surface.

4,180,841

GROUND FAULT CIRCUIT INTERRUPTER WITH GROUNDED NEUTRAL PROTECTION

Joseph C. Engel, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 21, 1977, Ser. No. 853,370
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—45 **16 Claims**



1. A ground fault protective apparatus for use on an AC electrical circuit having a line conductor and a neutral conductor grounded at a power source, comprising:

means for sensing current imbalance on said line and neutral conductors, said sensing means providing an output signal proportional to said imbalance;

means for integrating said output signal and for providing a trip indication whenever said signal integration value exceeds a predetermined reference level;

means for inducing a test voltage on said neutral conductor, whereby a current imbalance is produced between said line and neutral conductors which is proportional to the neutral-to-ground conductance;

means for providing a reference current proportional to said test voltage;

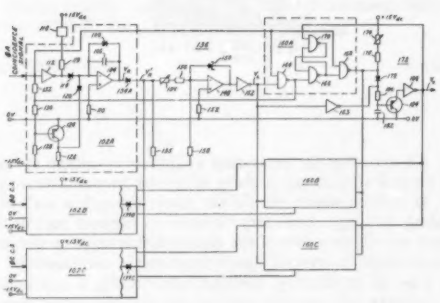
means connected to the input of said integrating means for comparing said reference current to the output signal of said sensing means, said comparing means supplying a signal current to the input of said integrator whenever the output signal of said sensing means rises above said reference current, said signal current being of sufficient amplitude to cause said integrator means to produce a trip indication.

4,180,842

TIMER CIRCUIT FOR USE IN PROTECTIVE RELAYING APPLICATIONS

Marvin F. Keeney, Springfield, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed May 12, 1978, Ser. No. 905,603
Int. Cl.[2] H02H *3/26*
U.S. Cl. 361—85 **19 Claims**



1. In a protective relay circuit employing phase comparator operation, the circuit including coincidence circuit means for producing a first output signal representative of the phase coincidence of at least two input signals thereto and timer circuit means for producing a timer output signal when the first output signal is of a predetermined duration, the timer output signal continuing as long as the phase coincidence continues and for a predetermined dropout time after the phase coincidence terminates, wherein the timer circuit means comprises:

(a) ramping circuit means for producing a substantially linear ramping voltage output signal;

(b) control circuit means for controlling said ramping circuit means wherein said ramping voltage output signal is caused to ramp with a positive slope or with a negative slope, or to truncate, said control circuit means coupled to the coincidence circuit means to receive the first output signal representative of the phase coincidence;

(c) level detector circuit means coupled to said ramping circuit means to receive said ramping voltage output signal, said level detector circuit means producing a level detector output signal when said ramping voltage output signal is of a predetermined threshold value, said level detector output signal continuing as long as the phase coincidence continues; said level detector circuit means coupled to said control circuit means wherein the pres-

ence of said level detector output signal develops a truncating signal which causes said ramping voltage signal to truncate; and

(d) output circuit means coupled to said level detector circuit means to receive said level detector output signal, said output circuit means producing the timer output signal, the timer output signal continuing as long as said level detector output signal continues and for the predetermined dropout time after the phase coincidence terminates.

4,180,843

DEVICE FOR PROTECTING ELECTRIC SYSTEMS, PARTICULARLY TELECOMMUNICATION SYSTEMS, AGAINST OVERVOLTAGE PULSES

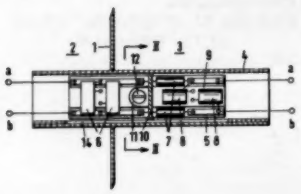
Rijnder Hagedoorn, Leidschendam, and Ernest J. E. Koenderink, The Hague, both of Netherlands, assignors to De Staat der Nederlanden, te dezen vertegenwoordigd door de directeur-generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Dec. 22, 1977, Ser. No. 863,410

Claims priority, application Netherlands, Dec. 22, 1976, 7614273

Int. Cl.[2] H02H *3/22*

U.S. Cl. 361—119 **7 Claims**



1. An assembly for protecting against overvoltage at least one electric circuit, particularly of a telecommunication system, at a place where the circuit passes through a wall of a building defining a boundary between an exposed part of the circuit and another part of the circuit that is less exposed and more sensitive to overvoltage, comprising in combination:

a tube of conducting material surrounding a connection between said exposed circuit part and said other circuit part and providing a passage for said connection through said wall;

an overvoltage protection circuit interposed in said connection and mounted on a printed circuit board located in said tube comprising at least two diverting components connected in such a way that an overvoltage peak can be diverted step by step thereby, and

a transverse partition of conducting material provided between the respective locations of said two diverting components, said printed circuit board and said partition being firmly mounted in said tube.

4,180,844

POWDER SPRAY APPARATUS AND METHOD FOR COATING INTERIOR SURFACE OF CONTAINERS

Richard O. Peck, Lakewood, Colo., assignor to Coors Container Company, Golden, Colo.

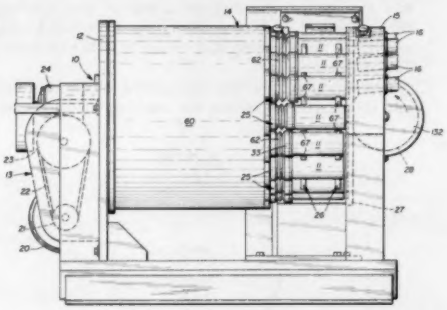
Filed Apr. 1, 1976, Ser. No. 672,591

Int. Cl.[2] B05B *5/00*

U.S. Cl. 361—226 **26 Claims**

1. An improved powder coating machine for applying a powder coating to the interior of ungrounded metallic container bodies having an open end, wherein the machine is of the kind having container positioning means conveying an array of said containers through an area for spray coating, said container positioning means including a shielding mask plate having a plurality of apertures aligned with openings in the container bodies; a series of plungers disposed opposite each of said apertures for resiliently pressing the container bodies against said mask plate; and a powder spray gun positioned adjacent to the mask plate for spraying charged powder through said apertures to coat the inside surface of the container bodies; the improvement comprising:

(a) non-conductive pad means on said plungers for directly



contacting said container bodies and preventing grounding of the container bodies to the plungers;

(b) said mask plate being constructed of non-conductive material for minimizing interference with charged powder from said powder spray gun and maintaining the container bodies in an ungrounded condition; and

(c) said powder spray gun being a tribo-electric-gas-dynamic powder coating gun.

4,180,845

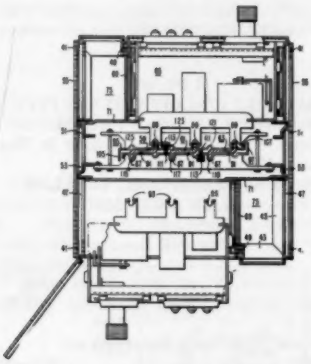
CONTROL CENTER WITH BUS BAR INSULATORS

Sadiq A. Shariff, Palos Park; Brij M. Bharteey, Bolingbrook, and Neal E. Rowe, Oak Forest, all of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1977, Ser. No. 831,718

Int. Cl.[2] H02B *1/04*

U.S. Cl. 361—334 **3 Claims**



1. A control center for distributing electric power from a power supply source to power consuming devices, comprising a cabinet having a plurality of vertically spaced compartments on the front side of the cabinet, a plurality of vertical, horizontally spaced, bus bars in said cabinet, insulating means mounting the bus bars with the surfaces of each bus bar being in surface-to-surface contact with the insulating means, the insulating means comprising a sheet-like member on each side of the spaced bus bars which members have interfitting portions including a flange-receiving groove in one member and a

flange in the other member and said interfitting portions extending between each pair of adjacent bus bars, a circuit interrupter structure in at least one compartment and movable transversely into and out of position adjacent to the bus bars, each bus bar comprising a portion disposed in a plane aligned with the direction of movement of the circuit interrupter, said structure comprising a contact member engaging a bus bar, each sheet-like member also comprising wall means forming horizontally spaced vertical ribs extending away from the other sheet-like member, the vertical ribs in one sheet-like member being aligned with the vertical ribs of the other member, each pair of aligned ribs forming a vertical chamber receiving said bus bar portion, and said bus bar portion in at least one of said ribs wherein one rib of a pair of aligned ribs extend further on one side of one sheet-like member than the other rib of said pair extends on the opposite side of the other sheet-like member, and whereby said ribs on said sheet-like members can accomodate bus bars of many different shapes.

4,180,846

VERTICAL BUS BARS FOR MOTOR CONTROL CENTER

John R. Wilson, Darien, and Jerome C. Wolski, Downers Grove, both of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 612,526, Sep. 11, 1975, abandoned. This application May 9, 1977, Ser. No. 794,910

Int. Cl.[2] H02B *1/04*

U.S. Cl. 361—357 **4 Claims**

1. A control center structure for distributing electric power from a power supply source to power consuming devices, comprising a cabinet forming a compartment and having front and rear sides, a plurality of vertical bus bars in the cabinet, each bus bar having an intermediate planar portion and one single leg extending toward the front side from the planar portion and providing a stab-type terminal at said front side, another single leg extending toward the rear side from the planar portion and providing a stab-type terminal at said rear side, at least one circuit interrupter in the cabinet comprising a clip-type contact member engaging the front extending leg of a bus bar, another circuit interrupter in the cabinet comprising a clip-type contact member engaging the rear extending leg of a bus bar, the circuit interrupters being movable toward and away from the bus bars to effect engagement and disengagement of the clip-type contact members with said terminals, said terminals being substantially aligned with the direction of movement of the circuit interrupters.

4,180,847

LIGHTING DISPLAY INSENSITIVE TO EXTRANEOUS LIGHT

Joseph V. Cresko, Tunkhannock, and John A. Moore, South Montrose, both of Pa., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 1, 1978, Ser. No. 939,150

Int. Cl.[3] G01D *11/28*

U.S. Cl. 362—30 **7 Claims**

1. Lighting display apparatus insensitive to extraneous light comprising:

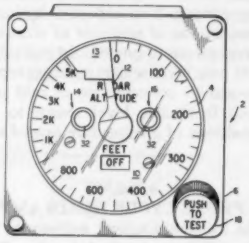
a housing;

means disposed in the housing and arranged to be energized for emitting light;

light transmitting means arranged in the housing and including a viewing surface having a matte finish and a highly polished surface opposite the viewing surface;

means arranged in the housing intermediate the light emitting means and the opposite surface of the light transmitting means for carrying the light emitted by the light emitting means to the light transmitting means for transmission therethrough; and

the matte finish of the viewing surface of the light transmitting means being effective for diffusing extraneous light so as to minimize such light entering the display apparatus and reflected in the direction of the viewer, and the highly polished opposite surface of the light transmitting means



being effective for efficiently transmitting light through said means.

4,180,848

HYDRAULIC APPARATUS FOR THE AUTOMATIC CORRECTION OF THE INCLINATION OF THE HEADLIGHTS OF A MOTOR VEHICLE

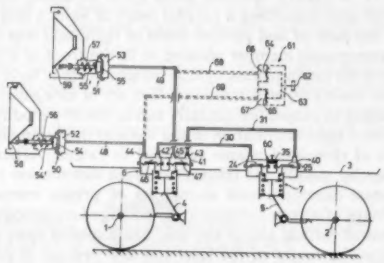
Inge Schwerin, Möglingen; Ulrich Zillgitt, Stuttgart; Steffen Schneider, Möglingen; Hellmut Kegel, Gerlingen; Hans-Rudolf Bodensieck, Gerlingen; Helmut Zauft, Gerlingen; Reinhold Poglitsch, Reutlingen, and Kurt Grabow, Feucht, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

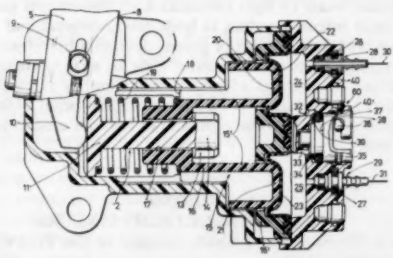
Filed Oct. 17, 1977, Ser. No. 842,997

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2654015

Int. Cl.[2] B60Q *1/10*

U.S. Cl. 362—71 **8 Claims**





1. In a hydraulic apparatus having means for automatically adjusting the positions of the headlights of a motor vehicle as a dependent function of the load on the axles, in which the movement of the front and rear axles relative to the sprung motor vehicle body are oppositely sensed by means of a metering piston of a level sensor installed in proximity to each vehicle axle and are transmitted by means of positioning elements

to the headlight housings, the further improvement wherein each metering piston in said level sensors includes a fork piece forming a pair of parallel and adjacently disposed positioning pistons and a pair of working chambers each adjacent one of said positioning pistons, two separate hydraulic lines each arranged to connect one of said pair of working chambers in said rear axle level sensor to one of said pair of working chambers in said front axle level sensor and two separate hydraulic lines each arranged to connect one of said pair of working chambers in said front axle level sensor to said means for adjusting the positions of a respective one of said headlights.

4,180,849

PEDAL CYCLE HEADLAMP

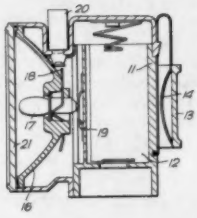
Sidney J. Parkin, London, England, assignor to The Ever Ready Company (Great Britain) Limited, London, England

Filed Aug. 18, 1977, Ser. No. 825,741

Claims priority, application United Kingdom, Aug. 18, 1976, 34510/76

Int. Cl.[2] F21V *33/00*

U.S. Cl. 362—72 **11 Claims**



11. A battery operated pedal cycle headlamp comprising a light source emitting a parallel beam of light, a lens positioned in the path of said parallel beam of light, said lens comprising a transparent member adapted to fit the front of a cycle headlamp for impingement by said parallel beam of light, said member having formed thereon a first set of elongated prisms arranged to extend horizontally and to thereby modify the transmitted light distribution in the vertical direction and a second set of elongated prisms arranged to extend vertically and to thereby modify the transmitted light distribution in the horizontal direction, said second set of prisms comprising two groups of prisms symmetrically arranged on opposite sides of a central vertical axis of the lens, being spaced apart and remote from the center of the lens, and said first set of prisms being offset vertically from the center of the lens, thereby providing a central region of the lens through which light passes unmodified by said prisms, such that said lens when impinged upon by a parallel beam of light produces a predetermined pattern of luminous intensity values in both the horizontal and vertical planes with said first set of prisms deviating by refraction and reflection said parallel beam of light to near horizontal, and with said second set of prisms deviating by refraction said parallel beam of light to form an emergent beam of increased horizontal spread to the right and left of said central region of the lens.

4,180,850

RETRACTABLE LIGHT FIXTURE

Jon A. Bivens, Upland, Calif., assignor to The Toro Company, Riverside, Calif.

Filed Jun. 29, 1978, Ser. No. 920,407

Int. Cl.[2] F21V *19/02*

U.S. Cl. 362—285 **14 Claims**

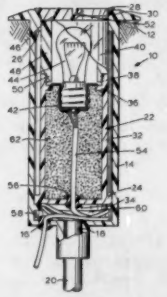
1. A retractable light fixture comprising:

(a) a hollow body having an opening into said body;

(b) a movable member disposed within said opening and adapted to slide through said opening between a first position retracted into said body and a second position at least partially extended out of said body, said movable member being biased toward said first position;

(c) hydraulic means having an inlet adapted for connection to a source of fluid under pressure for moving said movable member to said second position against said bias when fluid under pressure is applied to said inlet;

(d) a light bulb carried by said member; and,



(e) an electrical connector operably connected to said light bulb on one end and adapted on the other end for connection to an appropriate source of electrical energy for illuminating said bulb, said connector being disposed to allow said member to move between said positions and passing from said bulb through said body to the exterior of said body.

4,180,851

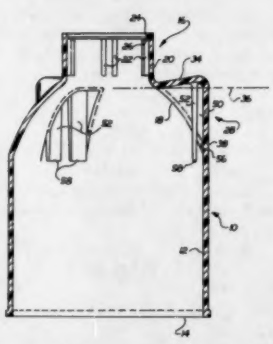
VENTILATED LAMP GUARD

John E. Ericson, Jr., Willoughby, Ohio, assignor to Ericson Manufacturing Company, Willoughby, Ohio

Filed Oct. 31, 1977, Ser. No. 847,246

Int. Cl.[2] F21V *11/12, 17/04*

U.S. Cl. 362—378 **8 Claims**



1. In a lamp bulb guard having a generally cylindrical, hollow body adapted to enshroud a lamp bulb therein to protect said bulb from contact with liquid and solid objects, said hollow body including an inwardly flared portion terminating in an axially extending generally circular tubular neck portion adapted to circumvallate an electrical socket for said lamp bulb, and means for attaching said neck portion to the electrical socket, the improvement which comprises a plurality of circumferentially spaced ventilating towers projecting from said flared portion, each of said towers including a generally radially extending top portion, a front wall portion extending between the top portion and said hollow body, and side wall portions extending between said top and portion and said inwardly flared portion, at least one axially extending slot in

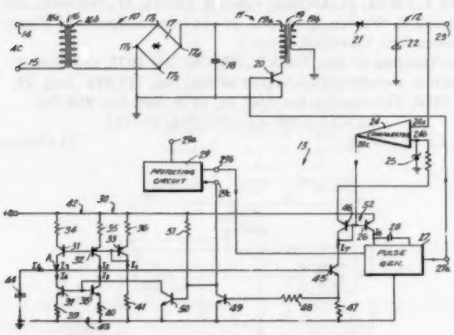
each of said towers to provide for ventilation of said lamp bulb guard when in use, and an axially extending baffle adjacent said at least one slot and positioned within said tower near but radially inwardly of said front wall portion, said baffle having an axial length greater than the axial length of said slot, and a width less than the circumferential width of said tower.

4,180,852

CONTROL CIRCUIT FOR USE IN A SWITCHING-TYPE REGULATOR

Akio Koizumi, Tokyo; Hiroshi Nakazawa, Kawagoe, and Mitsuo Ohsawa, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,549
Claims priority, application Japan, Jul. 25, 1977, 52-88933
Int. Cl.[2] H02P *13/22*
U.S. Cl. 363—49 **10 Claims**



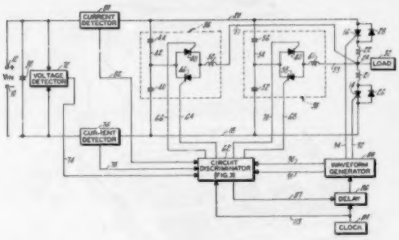
1. For use in a switching type regulator which includes a source of unregulated DC voltage, a switching circuit for interrupting said unregulated DC voltage to produce an AC voltage having a duty cycle which is a function of the operation of said switching circuit, a converter for converting said AC voltage to a regulated DC voltage, a controllable pulse generator for supplying pulses of controllable duration to said switching circuit thereby determining the duty cycle of said AC voltage, feedback means responsive to variations in said regulated DC voltage for controlling the duration of said generated pulses to maintain said regulated DC voltage at a desired level, and means for selectively limiting the operation of said pulse generator, a control circuit for resetting said last-mentioned means to an initial state and for gradually changing the duration of said pulses generated by said pulse generator in response to a predetermined condition, said control circuit comprising voltage generating means for generating a control voltage having a first rate of change with respect to time; reset means for resetting said means for selectively limiting the operation of said pulse generator when said control voltage attains a first level; means for changing the rate at which said control voltage changes once said means for selectively limiting the operation of said pulse generator is reset such that said control voltage then changes at a second rate of change with respect to time, said second rate of change being slower than said first rate of change; and means for using said control voltage at said second rate of change to correspondingly change the duration of said pulses generated by said pulse generator, whereby the level of said regulated DC voltage gradually changes.

4,180,853

TWO-STAGE COMMUTATION CIRCUIT FOR AN INVERTER

Clifford A. Scorso, Jr., Bolton, and Gordon J. Messer, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 23, 1978, Ser. No. 936,277
Int. Cl.[2] H02M *7/515*
U.S. Cl. 363—96 **12 Claims**



1. An inverter for converting DC electrical energy from a DC source into an output waveform having at least a fundamental sinusoidal component, said DC source having a voltage range which varies as a function of load current, comprising:

an input means for receiving electrical energy from a DC source, the voltage level of which varies within a range;

semiconductor switch means coupled to said input means which can be rendered conductive at a rate related to the fundamental sinusoidal component of the output waveforms;

commutation means connected to said semiconductor switch means including a first stage which is operable when the input parameters are within a first predetermined range and a second stage which is operable when the input parameters are within a second predetermined range; and

discriminator means connected to said commutation means for enabling both said first stage at said commutation means and said second stage of said commutation means depending on the input voltage level within said voltage range of said DC source.

4,180,854

PROGRAMMABLE CALCULATOR HAVING STRING VARIABLE EDITING CAPABILITY

Jack M. Walden; William D. Eads; Ray J. Cozzens; John L. Bidwell; Robert A. Jewett; Martin S. Wilson; Daniel J. Griffin; Robert E. Kuseski, and Louis T. Schulte, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 29, 1977, Ser. No. 837,771
Int. Cl.[2] G06F *3/02, 3/14*
U.S. Cl. 364—200 **2 Claims**

1. An electronic calculator comprising:

keyboard input means for entering alphanumeric program and data information, including string variables, into the calculator;

processing means for executing alphanumeric programs;

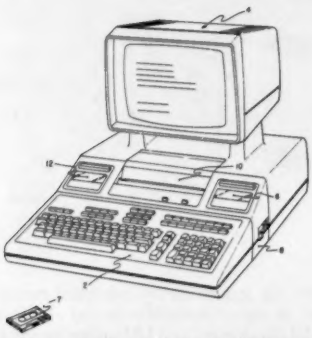
memory means for storing routines and subroutines of instructions to be selectively performed by the calculator and for storing a program and data, including a string variable, entered into the calculator; and

display means for displaying at least one line of alphanumeric program and data information;

said keyboard input means including means for entering a string variable modification statement into the calculator specifying a string variable, stored in said memory means, to be modified and further including program execution control means for controlling the execution of a program stored in said memory means, and editing means for en-

abling the user to alter alphanumeric information displayed by said display means;

said processing means being responsive to a string variable modification statement encountered during execution of a program stored in said memory means for interrupting execution of that program and for causing the value of the specified string variable stored in said memory means to be displayed on said display means, and being further



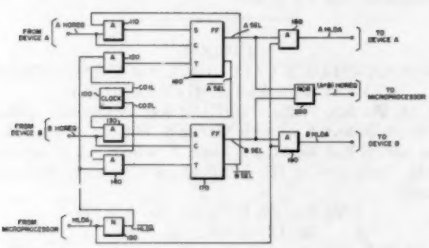
responsive to selective actuation by the user of said editing means for selectively altering the displayed value of the string variable, and being further responsive to actuation of said program execution control means following alteration of the value of the string variable for replacing the value of the string variable stored in said memory means with the altered value and for resuming execution of the program at the point at which interruption occurred.

4,180,855

DIRECT MEMORY ACCESS EXPANDER UNIT FOR USE WITH A MICROPROCESSOR

Charles K. Buedel, Wood Dale, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 7, 1978, Ser. No. 894,223
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **8 Claims**



1. A direct memory access unit for use in a microprocessor including a central processing unit operable to transmit only a single hold acknowledge signal, a memory connected to said central processing unit and a clock circuit operated to generate first and second phase output signals, said direct memory access unit operable to control a plurality of associated peripheral devices, at least one of said peripheral devices, requiring direct access to said memory via said central processing unit, each operated to transmit a memory request signal, said direct memory access unit including one direct memory access circuit comprising:

first gating means connected to at least one of said peripheral devices and connected to said clock circuit of said central processing unit, operated in response to said memory request signal, to said single hold acknowledge signal and in response to said first and second phase output signals of said clock circuit in order to produce a plurality of signals representing the memory access status of each of said connected peripheral devices;

a plurality of latching means each connected to a corresponding peripheral device and to said first gating means, operated in response to said operation of said first gating means to produce a plurality of output signals each indicating the memory access status of a corresponding peripheral device;

second gating means for combining said latching means output signals, connected to said latching means and to said microprocessor, operated in response to said latching means output signals to generate a single output signal for transmission to said microprocessor; and

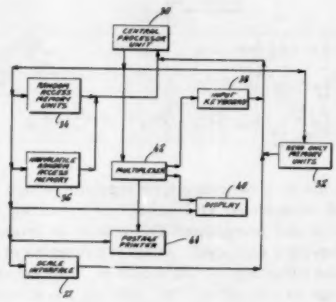
third gating means connected to a corresponding one of said plurality of peripheral devices and to said latching means, whereby in response to said latching means output signals and said single hold acknowledge signal transmitted by said microprocessor, a device acknowledge signal is transmitted to the requesting one of said plurality of peripheral devices.

4,180,856

ELECTRONIC POSTAGE METERING SYSTEM

Frank T. Check, Jr., Orange; Alton B. Eckert, Jr., Norwalk, and Joseph R. Warren, Stamford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 820,058, Jul. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,914, Aug. 19, 1976. This application Jun. 26, 1978, Ser. No. 918,784
Int. Cl.[2] G06F *15/02;* **G01G** *19/413*
U.S. Cl. 364—466 **17 Claims**



1. For use in setting postage in a meter, a system comprising:

(a) input means for generating weight-representing signals;

(b) input means for providing signals representing a destination zip code;

(c) means for generating a destination zone signal as a function of the destination zip code;

(d) means for computing the proper postage as a function of a weight-representing signal and a destination zone signal, said means for computing comprising:

(1) means for selecting a sequence consisting of a minimum postage amount and incremental postage amounts as a function of the destination zone signal;

(2) means for decrementing weight-representing signals by predetermined amounts during each of successive operations;

(3) means responsive after each decrementing operation for producing a first type of signal if the decremented result is greater than a predetermined number and a second type of signal if the decremented result is less than or equal to the predetermined number;

(4) means responsive to an initial one of said first type of signal to increase the minimum postage amount by a first incremental postage amount, said means being

responsive to each subsequently occurring first type of signal to further increase the result of previous incrementing operations by subsequent incremental postage amounts in the selected sequence; and

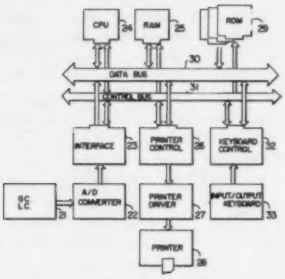
(e) a meter setting means for translating postage-representing signals for setting the postage into said meter.

4,180,857

APPARATUS FOR PROCESSING CHROMATOGRAPH DATA

Touhachi Yoshihara; Koji Nishiwaki, and Kiwao Seki, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 28, 1977, Ser. No. 811,139
Claims priority, application Japan, Jun. 30, 1976, 51-76348
Int. Cl.[2] G06F *15/20*; G06K *15/10*
U.S. Cl. 364—497 **6 Claims**



6. A data processing apparatus for printing a chromatogram having a plurality of reduced graphs comprising:

means for converting to digital signals an analog signal which is generated by a chromatograph apparatus and varies with time;

arithmetic means for subjecting said digital signals to an arithmetic operation according to a stored program to calculate the component concentrations from the chromatograph;

memory means for storing the result of said arithmetic operation, said memory means including a print buffer memory which successively stores in its plural bit locations the digital signals as a figure in general corresponding to said analog signals, said memory means including means for obtaining plural attenuated digital signals by attenuating each of said digital signals every time it is received according to plural attenuating factors before said digital signals have been transferred to said print buffer memory;

dot printer means for printing out on paper input signals in the form of plural dots, said printer means including a print head carrying thereon a plurality of print segments; and

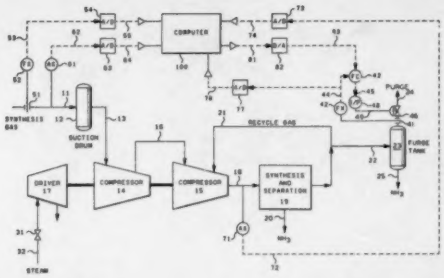
means for controlling said printer means to act in a manner so that after said bit locations of said buffer memory has been filled with the attenuated digital signals as a figure in general corresponding to said analog signals, the attenuated digital signals filling said bit locations are displayed as a plurality of reduced graphs corresponding to said figure in the form of plural dots on said paper by successively actuating all the print segments as the print head is moved in one direction across the paper, and that component concentrations are printed out as characters in rows each being in dot matrix form.

4,180,858

PURGE CONTROL FOR AMMONIA SYNTHESIS PROCESS

Larry D. Gaines, Bartlesville, Okla., and Richard F. Giles, Pinch, Va., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1978, Ser. No. 938,188
Int. Cl.[2] G06G *7/58*; G05B *17/00*
U.S. Cl. 364—502 **12 Claims**



7. A method for controlling an ammonia synthesis process comprising the steps of:

passing a stream of fresh synthesis gas, containing hydrogen, nitrogen and a small percentage of inert gases, based on the total volume of said fresh synthesis gas, into a compression zone to compress said fresh synthesis gas to a suitably high pressure;

separating ammonia from the compressed synthesis gas;

passing the compressed synthesis gas to a synthesis zone and therein forming ammonia from part of said synthesis gas;

passing at least a portion of the unreacted, compressed synthesis gas and ammonia gas as recycle gas to said compression zone to be combined with said fresh synthesis gas;

purging a portion of said recycle gas;

establishing a first signal representative of a generally continuous estimate of the concentration of the inert gases in said recycle gas;

establishing a second signal representative of the actual concentration of the inert gases in said recycle gas, said second signal being updated periodically every T seconds;

utilizing said first signal for feed forward control of said purging of a portion of said recycle gas; and

utilizing said second signal for feedback control of said purging of a portion of said recycle gas.

4,180,859

SYSTEM FOR MEASURING THE SPEED OF ROTATION OF A SYNCHRO BY MEANS OF A SAMPLING TECHNIQUE

Pierre L. V. Breant, Clamart, and Alain C. Fresnel, Plaisir, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,471
Claims priority, application France, Apr. 20, 1977, 77 11874
Int. Cl.[2] G06F *15/20*
U.S. Cl. 364—565 **9 Claims**

1. A system for generating a signal which is representative of the speed of rotation of a synchro using a first digital signal which is proportional to the sine of the angle of rotation of the shaft of the synchro and a second digital signal which is proportional to the cosine of said angle, comprising:

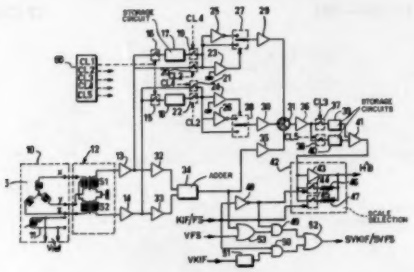
means for a first sampling of said sine signal;

means for a first sampling of said cosine signal;

means for a second sampling of said sine signal after a predetermined period of time has elapsed after said first sampling of the sine signal;

means for a second sampling of said cosine signal after a predetermined period of time has elapsed after said first sampling operation of the cosine signal;

means for multiplying said second sampled sine signal by said first sampled cosine signal for forming a first product;
means for multiplying said first sample sine signal by said second sample cosine signal for forming a second product;
means for squaring said sine and cosine signals;
means for adding said squared sine and cosine signals for forming a first sum;



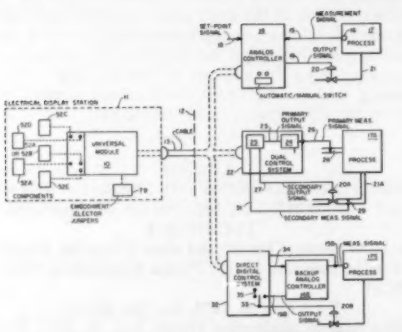
means for dividing said first product by said first sum for forming first quotient;
means for dividing said second product by said first sum for forming a second quotient; and
means for subtracting said second quotient from said first quotient for producing a signal which is representative of the speed of rotation of the said synchro.

4,180,860

DISPLAY STATION HAVING UNIVERSAL MODULE FOR INTERFACE WITH DIFFERENT SINGLE LOOP CONTROLLERS

Richard O. Driscoll, Mansfield; William E. Jordan, Norton, and Richard L. McAllister, Canton, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jun. 21, 1977, Ser. No. 809,148
Int. Cl.[2] G06F *3/14, 15/46*
U.S. Cl. 364—900 **16 Claims**



1. In an industrial process control system for use with complex processes having a number of conditions the values of which are sensed to produce measurement signals used to develop corresponding control signals for elements such as valves and the like; each combination of measured value and corresponding signal defining a process control loop, each loop including an individual analog controller arranged to compare the measurement signal with a preselected set point signal and to produce a corresponding control signal responsive to the difference between the measurement and set point signals; said analog controller being any one of a number of different functional types, such as for primary analog control or cascade control and the like, according to the particular process control requirement of each loop; each loop further including signal display means to present visual indications of selected operational information such as measurement signal or control signal levels;

apparatus providing improved means cooperable with any selected analog controller of said different functional types comprising:

(1) a display station remotely positioned from said selected analog controller and having a front panel with signal-controllable display means arranged to present to an operator a visual image indicating the value of at least one analog signal level respecting a single corresponding process control loop;

(2) transmission circuit means providing a number of individual signal circuits, said transmission circuit means connecting said display station with said selected analog controller and providing for transmission therebetween in both directions;

(3) universal module circuit means located at said display station and coupled to said transmission circuit means, said universal module circuit means comprising logic circuit means to receive information signals from said selected analog controller and to control the operation of said display means to present a visual indication of at least one of said received information signals, said logic circuits means including a plurality of sets of signal paths for effectuating display control operations respecting each of said different functional types;

(4) manually-shiftable selector means coupled to said logic circuit means and operable to condition said logic circuit means into any one of a number of different operating modes by selectively actuating predetermined ones from said sets of signal paths, each one of such different operating modes providing correspondingly different display arrangements for preselected information signals to conform with the type of analog controller coupled to the other end of said transmission circuit means; and

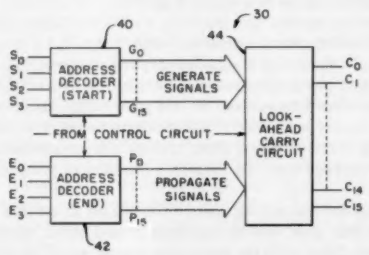
(5) said logic circuit means being conditioned by said selector means into a dedicated operating mode to control said display means to provide for the display of the particular analog signals delivered by said selected controller in accordance with the type of said analog controller.

4,180,861

SELECTIVELY OPERABLE MASK GENERATOR

Rolfe D. Armstrong, Escondido, and Charles R. Lang, Jr., Woodland Hills, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 31, 1978, Ser. No. 892,064
Int. Cl.[2] G06F *7/00*
U.S. Cl. 364—900 **6 Claims**



1. A mask generator for generating a mask having a plurality of bits at the mask generator output and having a selective number of inhibiting bits of a predetermined value in said plurality of output bits, comprising:

decoder means for receiving a first set of address signals representing the beginning inhibiting bit of the mask and for receiving a second set of address signals representing

the address of the end inhibiting bit of the mask, and for converting said first and second set of address signals to a generate signal corresponding to each of said output bits, including an enabled generate signal, and to a propagate signal corresponding to each of said output bits, including an enabled propagate signal; and

look-ahead carry circuit means for receiving said generate and propagate signals and for producing said output bits, said outputs bits including said inhibiting bits beginning with an inhibiting bit corresponding to said enabled generate signal and continuing up to an inhibiting bit corresponding to said enabled propagate signal, said look-ahead carry circuit means including:

first gate means associated with each one of said output bits for receiving the generate signal corresponding to each of any output bits preceding its associated one of said output bits and for receiving the propagate signal corresponding to each of any output bits preceding its associated one of said output bits and the propagate signal corresponding to its associated one of said output bits; and

second gate means associated with each one of said output bits for receiving the output of the first gate means associated with its associated one of said output bits and the generate signal corresponding to its associated one of said output bits.

4,180,862

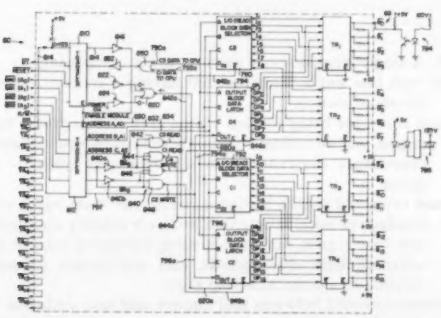
PROGRAMMABLE CONTROLLER USING MICROPROCESSOR

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Division of Ser. No. 701,858, Jul. 1, 1976, Pat. No. 4,107,785. This application Jun. 12, 1978, Ser. No. 914,525

Int. Cl.[2] G06F *3/00*

U.S. Cl. 364—900 **3 Claims**



1. In an input/output circuit for a programmable controller of the type including a data line for receiving selected binary logic, first logic means for directing binary logic from said data line to a selected one of a plurality of external logic terminals and second logic means for directing binary logic from a selected one of said external logic terminals to said data line, the improvement comprising: said first logic means includes a memory device having output terminals selectable by distinct addresses each address corresponding to one of said external logic terminals; an output lead means for connecting each of said output terminals to selected external terminals whereby logic from said output terminals of said memory device is directed to said external terminals in accordance with stored logic at said output terminals; and, means for selectively storing logic from said data line at said output terminals.

4,180,863

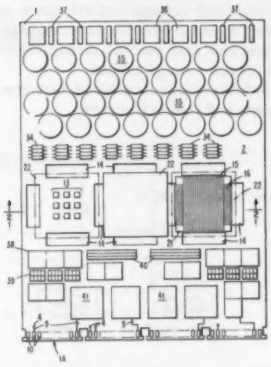
MAGNETIC DOMAIN DEVICE MODULAR ASSEMBLY

Kailash C. Joshi, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,927

Int. Cl.[2] G11C *19/08, 5/04*

U.S. Cl. 365—2 **11 Claims**



1. Field accessed magnetic domain device modular assembly apparatus comprising:

a substrate having at least one surface with a predetermined circuitized pattern thereon,

plural groups of magnetic domain devices mounted on said substrate and electrically connected to said circuitized pattern, each of said groups having at least one of said magnetic domain devices,

plural rectangular patterns of non-open ended slots disposed through said substrate, each of said groups being circumscribed by four of said slots arranged in one of said rectangular patterns,

plural rotational magnetic field coil drive systems, each of said drive systems having orthogonal first and second coils of plural turns each and coacting with a mutually exclusive particular one of said groups of magnetic domain devices, the turns of said first coil of each system encompassing said particular one of said groups through two opposing slots circumscribing said particular one of said groups, the turns of said second coil of each system encompassing said first coil and said particular one of said groups encompassed by said first tab through the other two opposing slots circumscribing said particular one of said groups, and

plural closed magnetic bias field systems, each of said bias field systems coacting with a mutually exclusive one of said groups of magnetic domain devices and the latter's said encompassing drive system, each of said bias field systems having means for enclosing the lastmentioned said one of said groups and its said encompassing drive system, said means being extended through the slots circumscribing said lastmentioned one of said groups and being resiliently engageable with said last mentioned slots.

4,180,864

BUBBLE MEMORY COIL DRIVE CIRCUIT

Sidney J. Schwartz, Vista, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 5, 1978, Ser. No. 939,347

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—6 **9 Claims**

1. Circuitry in which a alternating current wave form is generated in drive coil means of a bubble memory for providing the rotating in-plane magnetic field for propogating magnetic bubbles in said memory and for matching the magnetic

field to the magnetic relationship between the magnetic bubbles and propogate elements, comprising:

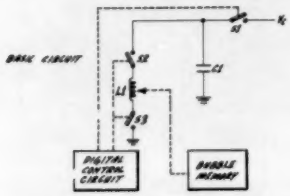
voltage source means and a reference voltage source means;

at least one coil means for providing said in-plane magnetic field;

energy storage means which in conjunction with the coil means determines the current wave form connected by means of switches in a parallel arrangement with said coil means between said voltage and reference source means;

a first switching means connected in series with said voltage source means and said parallel arrangement of said coil means and energy storage means;

a second switching means connected between said energy storage means and said coil means;



a third switching means connected between said coil means and said reference source means;

digital control means;

said first, second and third switching means connected to said digital control means whereby said first switching means is momentarily closed each desired cycle to connect said voltage supply means to said energy storage means to supply energy thereto, and

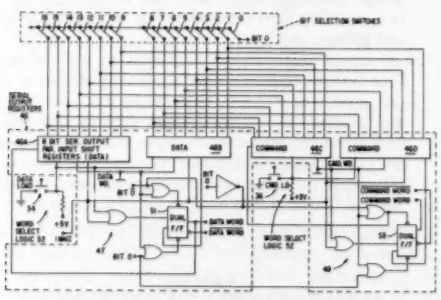
wherein said second and third switching means are actuated by said digital control means after energy has been supplied to said energy storage means to connect and disconnect said energy storage means with said coil means to control the flow of current from said energy storage means through said coil means.

4,180,865

PORTABLE MULTIPLEX BUS EXERCISER

Jay L. Richman, Montville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 27, 1978, Ser. No. 946,286
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—63 **7 Claims**



1. An exerciser for exercising a digital communications multiplex bus, comprising:

bit selection means operator-operable for selecting digital bits to provide digital word patterns;

register means connected to the bit selection means for receiving the digital word patterns therefrom;

word select means associated with the register means and operator-operable for rendering the register means operable for receiving the digital word patterns therefrom;

timing means for providing timing signals;

the word select means connected to the timing means and responsive to particular timing signals therefrom for shifting the selected digital word patterns from the register means to the timing means which synchronizes the selected shifted digital word patterns;

a plurality of output channels connected to the timing means for receiving the synchronized digital word patterns therefrom; and

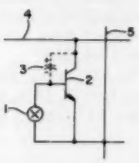
control means connected to the timing means and to the plurality of output channels and responsive to other particular signals from the timing means for selecting at least one of the output channels to provide output signals for exercising the digital communications multiplex bus.

4,180,866

SINGLE TRANSISTOR MEMORY CELL EMPLOYING AN AMORPHOUS SEMICONDUCTOR THRESHOLD DEVICE

Roy R. Shanks, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 1, 1977, Ser. No. 820,869
Int. Cl.[2] H01L *45/00;* **G11C** *11/24*
U.S. Cl. 365—186 **7 Claims**



1. A single transistor cell memory array comprising:

at least one single transistor cell having a transistor and a threshold switch;

said transistor being formed with a collector region, a base region, and an emitter region, there being a base-collector capacitance associated with said base and collector regions;

said threshold switch having a conductive state and a nonconductive state, said switch being electrically coupled to said base region, said switch being formed of a layer of a tellurium base chalcogenide, and said switch normally residing in a nonconducting state;

means coupled between said emitter and said collector regions for charging said base-collector capacitance to place said single transistor cell in a first memory state;

means coupled to said threshold switch and one of said emitter and collector regions to apply a signal to switch said threshold switch to its conductive state to discharge said base-collector capacitance to place said single transistor cell in a second memory state; and

means coupled between said emitter and said collector regions to determine the charge condition of said base-collector capacitance to determine the memory state of said single transistor cell.

DESIGN PATENTS

GRANTED DEC. 25, 1979

ERRATA

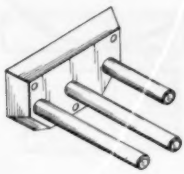
For CLASS	See PATENT NO.
D13–012	253,768
D19–065	253,773
D21–149	253,784
D21–150	253,785
D21–032	253,786
D21–234	253,788

DESIGNS

DECEMBER 25, 1979

253,736
TOOTHBRUSH HOLDER OR SIMILAR ARTICLE
Joseph J. Guarino, 26431 Rim Rd., Hemet, Calif. 92343
Filed May 1, 1978, Ser. No. 901,972
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—94

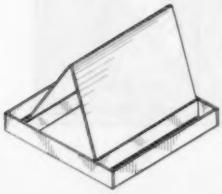
253,737
SKI EQUIPMENT HOLDER
Ronald H. Brink, Ogdensburg, N.Y., assignor to Northern Manufacturers, Canton, N.Y.
Filed Feb. 17, 1978, Ser. No. 878,929
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



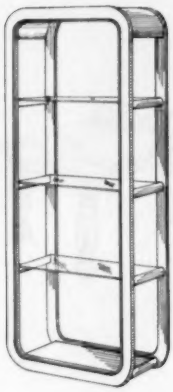
253,738
DISPLAY RACK
Allan H. Willinger, New York, N.Y., assignor to Willinger Bros., Inc., New York, N.Y.
Filed Jul. 15, 1977, Ser. No. 816,100
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157

253,739
TABLE
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Nov. 28, 1977, Ser. No. 855,248
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

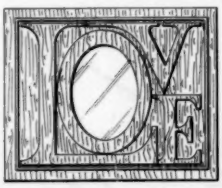
253,740
STACKABLE ART EASEL
Dorothea L. Dubler, 250 N. Stetson Park Dr., Deland, Fla. 32720
Filed Aug. 24, 1977, Ser. No. 827,382
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—180



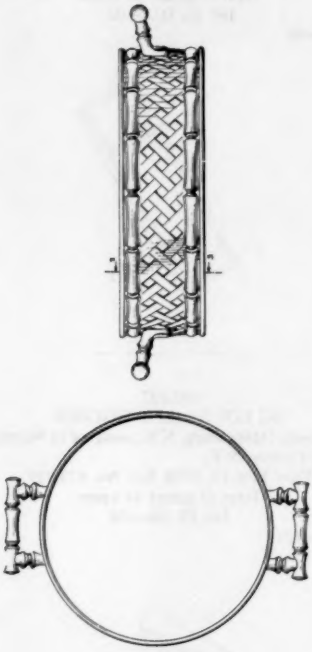
253,741
ETAGERE
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Delphi, Ind.
Filed Aug. 10, 1977, Ser. No. 823,293
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



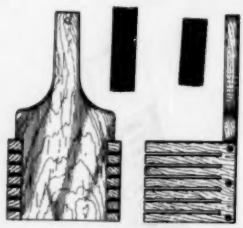
253,742
PICTURE FRAME
Joseph R. English, 1168 Oakleigh Dr., East Point, Ga. 30344
Filed Dec. 12, 1977, Ser. No. 859,286
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—236



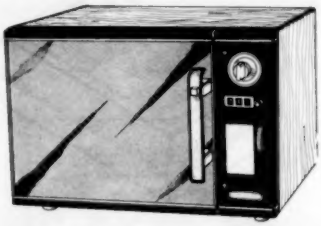
253,743
PIE PLATE HOLDER
Stuart A. Young, Meriden, Conn., assignor to International Silver Company
Filed Jun. 29, 1977, Ser. No. 811,156
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—39



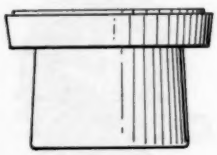
253,744
BREAD SLICING GUIDE
Gary L. Davis, 736 E. 650 South, Centerville, Utah 84014
Filed Mar. 30, 1978, Ser. No. 891,739
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—46



253,745
MICROWAVE OVEN OR SIMILAR ARTICLE
Torio Hida; Katsuyoshi Sato, and Takashi Kojima, all of Kawasaki, Japan, assignors to The General Corporation
Filed Oct. 21, 1977, Ser. No. 844,501
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128

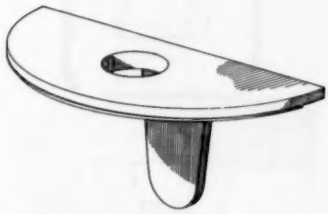


253,746
PRESSURE COOKER REGULATOR
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and James P. Stevens, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Continuation-in-part of Ser. No. 774,581, Mar. 7, 1977. This application Apr. 10, 1978, Ser. No. 895,284
Term of patent 14 years
Int. Cl. D7—*02*; D10—*04*
U.S. Cl. D7—129



253,747
COMBINATION LOCK
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.
Filed Oct. 12, 1977, Ser. No. 841,642
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—338

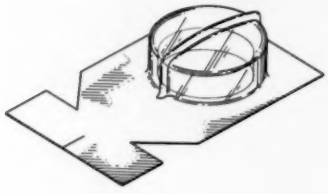
253,748
TRACK BASE FOR COLUMNAR CURTAINS
Alex S. Kovacs, 2431 E. 34 Ave., Vancouver, British Columbia, Canada (V5R 2S6)
Filed May 9, 1978, Ser. No. 904,249
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—363



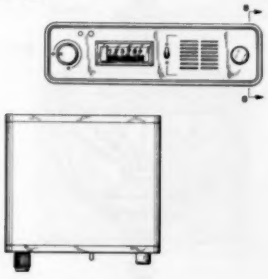
253,749
DOOR KNOCKER OR THE LIKE
Rudolph Paulich, Mercer Island, Wash., assignor to Columbia Specialty Co., Inc., Seattle, Wash.
Filed Jun. 17, 1977, Ser. No. 807,387
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D8—401

253,750
LIQUID CONTAINER
Tim M. Uyeda, South San Gabriel, Calif., assignor to Flambeau Products Corporation
Filed May 24, 1977, Ser. No. 800,089
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—175

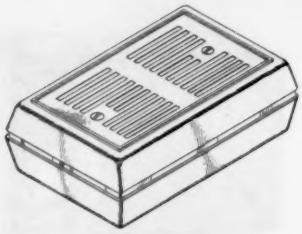
253,751
PHARMACEUTICAL BLISTER PACKAGE
Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 27, 1977, Ser. No. 801,285
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



253,752
RADAR WARNING RECEIVER
Robert E. Dilgard, Jr., Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc.
Filed Jul. 13, 1978, Ser. No. 924,460
Term of patent 14 years
Int. Cl. D10—*05*; D13—*03*
U.S. Cl. D10—104



253,753
HOUSING FOR SMOKE DETECTOR OR SIMILAR ARTICLE
John L. Poesl, 1118 Cabot St., Peterborough, Ontario, Canada
Filed Jan. 6, 1978, Ser. No. 868,128
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



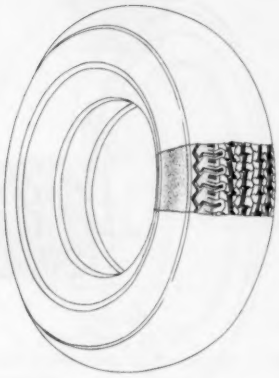
253,754
PENDANT
Joe B. Hill, 4930 Spokane, Detroit, Mich. 48204
Filed Jan. 6, 1977, Ser. No. 757,306
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—53

253,755
PENDANT OR SIMILAR ARTICLE
Gary E. Minassian, 465 S. Ranchview Cir., Apt. 50, Anaheim, Calif. 92807
Filed Oct. 18, 1977, Ser. No. 843,352
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

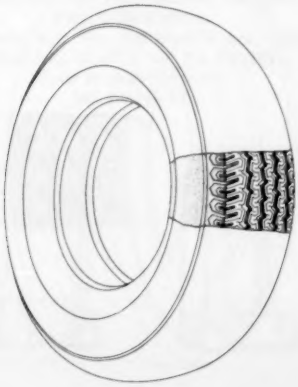
253,756
CHRISTMAS ORNAMENT
William B. Campbell, deceased, late of Saint Paul, Minn. (by Doris B. Campbell, administratrix), assignor to Ball Corporation, Muncie, Ind.
Filed Jan. 17, 1978, Ser. No. 870,259
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

253,757
PLANT RESERVOIR
Richard E. Cone, 249 Bowman Dr., Kent, Ohio 44240
Filed May 10, 1978, Ser. No. 904,629
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164

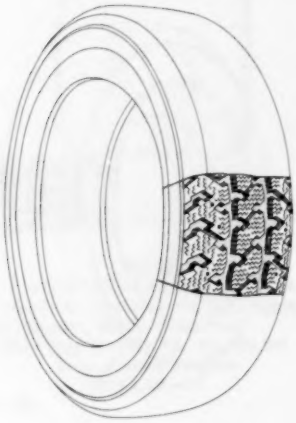
253,758
TIRE
Jean-Claude Péron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Feb. 13, 1978, Ser. No. 877,397
Claims priority, application France, Sep. 21, 1977, 541
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



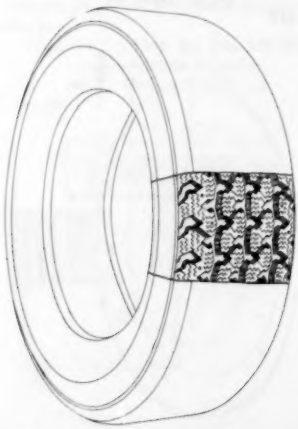
253,759
TIRE
Jean-Claude Péron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Feb. 13, 1978, Ser. No. 877,398
Claims priority, application France, Sep. 21, 1977, 541
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



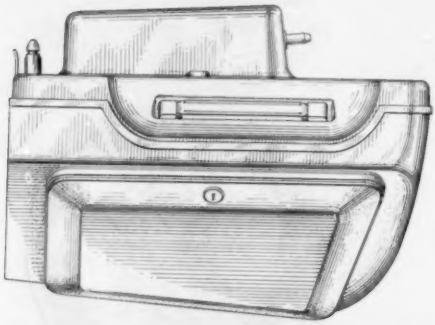
253,760
TIRE
Michel R. de Saint-Michel, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed May 15, 1978, Ser. No. 905,776
Claims priority, application France, Dec. 14, 1977, 548
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

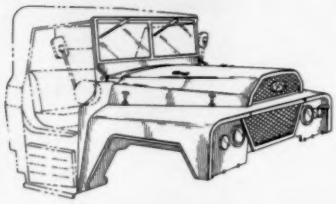


253,761
TIRE
Michel R. de Saint-Michel, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed May 15, 1978, Ser. No. 905,775
Claims priority, application France, Dec. 9, 1977, 547
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



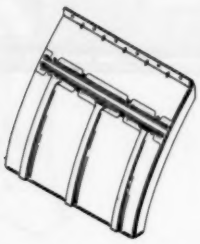
253,762
MOTORCYCLE ARTICLE CARRIER
Craig W. Vetter, and Charles Perethian, both of San Luis Obispo, Calif., assignors to Vetter Fairing Company, San Luis Obispo, Calif.
Filed May 1, 1978, Ser. No. 901,323
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



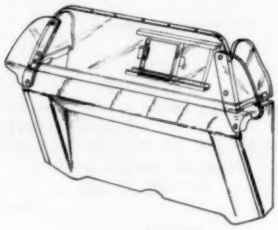


253,763
COMBINED HOOD, WINDSHIELD, FENDERS, HEADLIGHTS AND GRILLE UNIT
Paul E. R. Legueu, 85 Avenue de Mazy-44380, Pornichet, France
Filed Mar. 22, 1978, Ser. No. 889,071
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—164

253,764
VEHICLE FENDER GUARD
James R. Lockwood, Wapakoneta; Joseph A. Ferrante, Toledo, both of Ohio; James P. Olszewski, Temperance, Mich., and John A. Semelka, Maumee, Ohio, assignors to Lancaster Colony Corporation, Columbus, Ohio
Filed Oct. 27, 1977, Ser. No. 846,265
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185



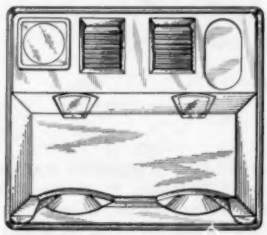
253,765
PROTECTIVE VEHICLE PARTITION
Sam Roggin, 23091 Rosewood, Oak Park, Mich. 48237
Filed Oct. 13, 1977, Ser. No. 841,963
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—195



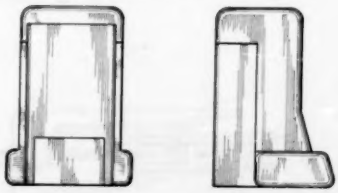
253,766
INSTRUMENT PANEL
Norman Dusanek, 8116 Deering Ave., Canoga Park, Calif. 91304
Filed Aug. 26, 1977, Ser. No. 828,173
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

253,767
HAND MICROPHONE
Donald W. Peterson, Conneaut, Ohio, assignor to The Astatic Corporation, Conneaut, Ohio
Filed Jan. 24, 1979, Ser. No. 6,283
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

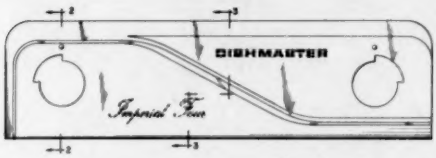
253,768
CONTROL PANEL
Harry Weitz, New Hyde Park, N.Y., assignor to Instrument Systems Corporation
Filed Mar. 10, 1978, Ser. No. 885,404
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



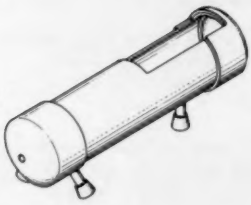
253,769
ADAPTER FOR TELEPHONE CRADLE PROTUBERANCE
Thomas L. Marks, P.O. Box 746, Fordyce, Ark. 71742
Filed Aug. 22, 1977, Ser. No. 826,888
Term of patent 14 years
Int. Cl. 14—*03*
U.S. Cl. D14—65



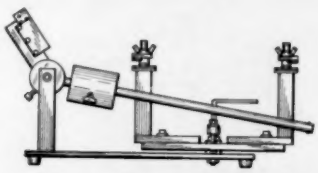
253,770
NAMEPLATE FOR A DISHWASHER CONTROL PANEL
Eugene R. Flynn, Farmington Hills, and Harlan E. Kifer, Birmingham, both of Mich., assignors to Manville Mfg. Co., Pontiac, Mich.
Filed Aug. 15, 1977, Ser. No. 824,501
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—36

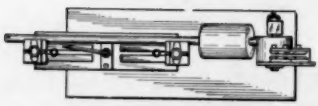


253,771
CAN RECYCLING PRESS
Alton W. Hubbard, Fortuna, and Pete A. Johnson, Eureka, both of Calif., assignors to Jahs Enterprises, Inc., Eureka, Calif.
Filed Apr. 11, 1977, Ser. No. 786,123
Term of patent 14 years
Int. Cl. D23—*02*; D15—*99*
U.S. Cl. D15—123

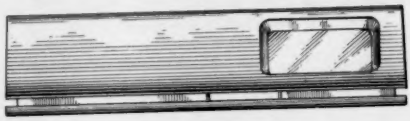


253,772
MACHINE FOR STRINGING RACQUETS
Donald A. Chartier, 88 Walnut St., Nashua, N.H. 03060, and Richard Janes, 4E Pine Isle Dr., Derry, N.H. 03038
Filed Jul. 25, 1977, Ser. No. 818,619
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

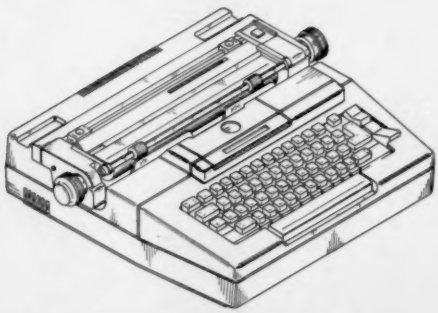




253,773
COMBINED MESSAGE HOLDER AND SIGNAL
Walter I. Bieger, St. Paul, Minn., assignor to Arthur Salm Inc., St. Paul, Minn.
Filed May 19, 1977, Ser. No. 798,435
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—65



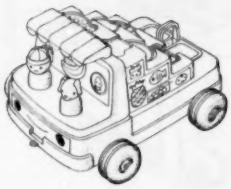
253,774
TYPEWRITER
James J. Beinkowski, Cazenovia, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Mar. 24, 1978, Ser. No. 889,992
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



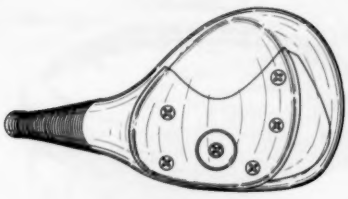
253,775
COPY HOLDER FOR A TYPEWRITER OR SIMILAR ARTICLE
Barry J. Lar Rieu, P.O. Box 752, Menlo Park, Calif. 94025
Filed Sep. 21, 1977, Ser. No. 836,176
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

253,776
PINWHEEL
Lester V. Molenaar, Willmar, Minn., assignor to James Industries, Inc., Hollidaysburg, Pa.
Filed Dec. 30, 1977, Ser. No. 868,282
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—93

253,777
COMBINED TOY VEHICLE AND STACKED, REMOVABLE ARTICLES
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed May 10, 1977, Ser. No. 795,592
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137

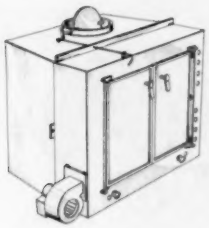


253,778
GOLF CLUB HEAD
Theodore N. Madison, 49 Winthrop Rd., Windsor, Conn. 06095
Filed Jan. 27, 1977, Ser. No. 763,064
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—214

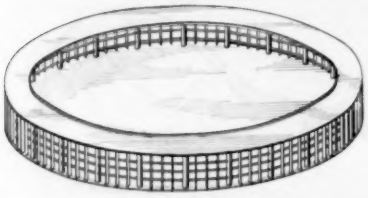


253,779
GOLFER'S TOOL
Boris Kralevich, 4868 Beacon Hill Dr., Castro Valley, Calif. 94546
Filed Mar. 16, 1978, Ser. No. 887,453
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

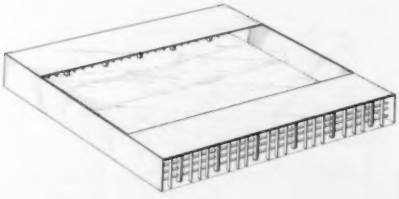
253,780
WOOD AND COAL BURNING STOVE
Larry A. Schwartz, 67 Hess Ave., Warwick, R.I. 02889, and Charles E. Spalt, 376 N. Main St., Cohasset, Mass. 02025
Filed Nov. 28, 1977, Ser. No. 856,021
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



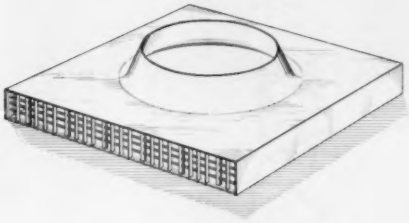
253,781
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 814,825
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



253,782
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 815,035
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



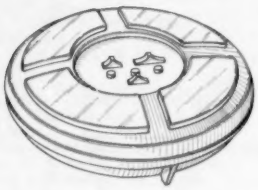
253,783
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 815,036
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



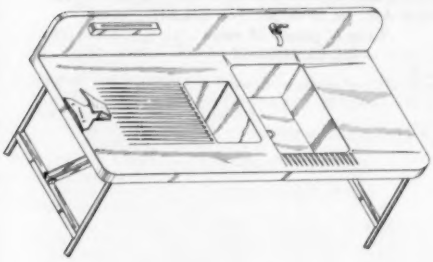
253,784
FIGURE TOY
Shigeru Saitoh, 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Apr. 20, 1976, Ser. No. 674,846
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—149

253,785
TOY WORM
Louis V. Cook, 2207 Irondale Rd., Libertyville, Ill. 60048
Filed Jul. 5, 1977, Ser. No. 813,118
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

253,786
ELECTRONIC GAME HOUSING
Douglas P. Montague, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Apr. 13, 1978, Ser. No. 895,993
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—32

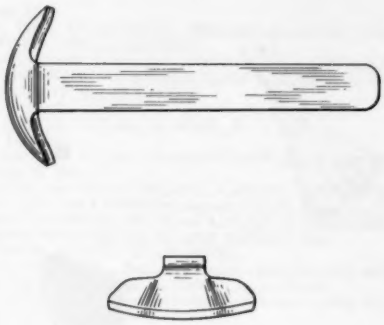


253,787
COMBINED SINK AND TABLE
Albert L. Kinsey, 10810 Burbank Dr., Potomac, Md. 20854
Filed Dec. 28, 1977, Ser. No. 865,265
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—61

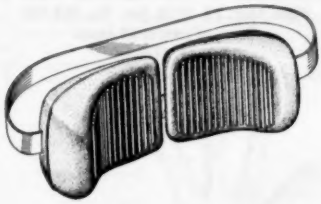


253,788
GOLFER'S TOOL
Boris Kralevich, 4868 Beacon Hill Dr., Castro Valley, Calif. 94546
Filed Apr. 26, 1978, Ser. No. 900,284
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

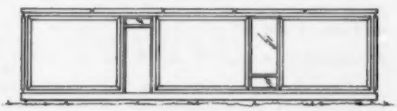
253,789
TONGUE CLEANER
Subhash R. Gupta, 31 Queen St., Worcester, Mass. 01602
Filed Feb. 3, 1978, Ser. No. 874,838
Term of patent 3½ years
Int. Cl. D24—*02*
U.S. Cl. D24—23



253,790
BACK MASSAGER ATTACHMENT
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc.
Filed Aug. 17, 1977, Ser. No. 825,299
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



253,791
BUILDING UNIT
Franklyn L. Whitney, R.D. 1, Box 447-A, Stockton, N.J. 08559
Filed Nov. 14, 1977, Ser. No. 851,544
Term of patent 3½ years
Int. Cl. D25—*03*
U.S. Cl. D25—33



253,792
PEDICURE INSTRUMENT
Dennis R. Phair, 2429 Launcelot Ct., Colorado Springs, Colo. 80904
Filed Jun. 27, 1977, Ser. No. 810,154
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—59

253,793
MIRROR
Ernest L. Peterson, 204 N. Third St., Selah, Wash. 98942
Filed Mar. 21, 1978, Ser. No. 888,550
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—70

253,794
CANDLESTICK
David R. Hilgeman, 2805 Hartmetz Ave., Evansville, Ind. 47712
Filed Apr. 7, 1978, Ser. No. 894,575
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

253,795
CANDLESTICK
David R. Hilgeman, 2805 Hartmetz Ave., Evansville, Ind. 47712
Filed Apr. 10, 1978, Ser. No. 894,908
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF DECEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co., Inc.: *See—*
Greer, Bradley G., 4,180,117, Cl. 160-67.000.

A. W. Faber-Castell: *See—*
Katz, Otto, 4,180,339, Cl. 401-67.000.

AB Trelleborgplast: *See—*
Tornerfelt, Gosta T. I., 4,179,790, Cl. 29-416.000.

Abbott Laboratories: *See—*
Becker, Frank C.; and Li, Jorge P., 4,180,508, Cl. 260-326.50C.
Genese, Joseph N., 4,180,070, Cl. 128-218.00M.
Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., 4,180,556, Cl. 424-1.000.
Patterson, Roy; and McIntire, Floyd C., 4,180,562, Cl. 424-91.000.
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Abbott, Warren G.: *See—*
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Abdo, Kamal M.: *See—*
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Feldstein, Robert S., 4,180,809, Cl. 340-384.00E.

Abiko, Toshio: *See—*
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, 4,180,811, Cl. 340-566.000.

Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., to United States of America, Air Force. Gating apparatus for static crossed field photomultipliers. 4,180,725, Cl. 250-207.000.

Abrams, Donald W., to General Electric Company. Sealing grommet in a refrigerator cabinet. 4,180,297, Cl. 312-214.000.

Abrams, Edwin F.: *See—*
Olcott, Eugene L.; and Abrams, Edwin F., 4,180,211, Cl. 239-265.430.

ABU Aktiebolag: *See—*
Harre, Kurt J. S.; and Tufvesson, Kent A., 4,180,217, Cl. 242-84.20A.

Abu-Shumays, Ahmad, to Varian Associates, Inc. Thermostatable flow cell for fluorescence measurements. 4,180,739, Cl. 250-461.00R.

ACF Industries, Incorporated: *See—*
Niggemeier, Joseph F.; and Yeates, Richard P., 4,179,998, Cl. 410-64.000.
Reedy, Charles E., 4,180,242, Cl. 251-144.000.

Acro, Inc.: *See—*
Robinson, Mark L., 4,180,264, Cl. 273-73.00J.

Adachi, Yoshiharu: *See—*
Kito, Masahiro; and Adachi, Yoshiharu, 4,179,980, Cl. 91-6.000.

Adams, George B., to Lockheed Missiles & Space Company, Inc. Electrically rechargeable battery. 4,180,623, Cl. 429-21.000.

Adams, Harold R. Valve stem cleaner and lubricator. 4,180,144, Cl. 184-1.00R.

ADIDAS, Fabrique de Chaussures de Sport: *See—*
Denu, Francis, 4,179,754, Cl. 2-67.000.

AFA Corporation, The: *See—*
Quinn, David R., 4,180,174, Cl. 215-221.000.

Agency of Industrial Science and Technology: *See—*
Shimokawa, Kenji; Nagatomo, Muneshige; and Tanaka, Yasuo, 4,179,895, Cl. 62-2.000.

AGFA-GEVAERT N.V.: *See—*
Suys, Andre R.; and Van Landeghem, Willy K., 4,180,740, Cl. 250-483.000.

Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I. Installation for controlling pressure of gas under shaft top in super-capacity blast furnace. 4,180,249, Cl. 266-78.000.

Air-Dry Corporation of America: *See—*
Sheldon, Robert S.; and Rabek, Jan W., 4,179,917, Cl. 73-17.00A.
Sheldon, Robert S.; and Rabek, Jan W., 4,180,240, Cl. 251-127.000.

Air Products & Chemicals, Inc.: *See—*
Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., 4,179,897, Cl. 62-9.000.

Airco, Inc.: *See—*
Guckel, Henry, 4,180,771, Cl. 324-71.0SN.

Airheart, Franklin B., to Hurst Performance, Inc. Brake assembly with dual compensation adjustment. 4,180,146, Cl. 188-71.800.

Aisan Idustry Co., Ltd.: *See—*
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.

Aisin Seiki Kabushiki Kaisha: *See—*
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Akao, Takeshi: *See—*
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,180,188, Cl. 222-368.000.

Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, to Mitsubishi Denki Kabushiki Kaisha; and Kabushiki Kaisha Terauchi Seisakusho. Power wrench. 4,179,955, Cl. 81-57.110.

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Albaric, Jacques E.: *See—*
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Alberta Oil Sands Technology and Research Authority: *See—*
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Alberti, James; and Schlosser, Helmut. Portable childbirth chair with electronic monitoring apparatus. 4,180,062, Cl. 128-698.000.

Albertini, Rocco D., to Baldt Incorporated. Improved coupling link. 4,179,878, Cl. 59-85.000.

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Alia, Dominic. Processible and vulcanizable polar polymers. 4,180,531, Cl. 525-214.000.

Allan, James C., to Burroughs Corporation. Cleaning disk assembly for oppositely-oriented, dual-component magnetic transducers. 4,180,840, Cl. 360-128.000.

Allen, Richard, to Varo Semiconductor, Inc. Method of making a transformer with an improved insulation system. 4,179,796, Cl. 29-605.000.

Allias, Bernard; and Decaudin, Charles, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Hand tool for cutting an optical fibre. 4,179,807, Cl. 30-124.000.

Allied Chemical Corporation: *See—*
Li, Hsin L.; Oswald, Hendrikus J.; and Mumford, Robin B., 4,180,214, Cl. 242-47.000.

Allis-Chalmers Corporation: *See—*
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Shaver, J. Lyle, 4,180,081, Cl. 130-27.00R.

Alpha, James W.; and Dumbaugh, William H., Jr., to Corning Glass Works. Thin silicon film electronic device. 4,180,618, Cl. 428-428.000.

Alphandary, Maurice, to United States of America, U.S. Environmental Protection Agency. Hopper. 4,180,186, Cl. 406-152.000.

Altec Corporation: *See—*
Rumbaugh, Paul S., 4,180,780, Cl. 330-252.000.
Spranger, Paul B., 4,180,710, Cl. 179-115.50H.

Altex Scientific, Inc.: *See—*
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Alza Corporation: *See—*
Choi, Nam S.; and Heller, Jorge, 4,180,646, Cl. 528-153.000.
Heller, Jorge; and Baker, Richard W., 4,180,064, Cl. 128-130.000.
Michaels, Alan S., 4,180,073, Cl. 128-260.000.

Amann, Fritz, to SKW Trostberg Aktiengesellschaft. Composition for controlling plant growth in viticulture. 4,180,393, Cl. 71-78.000.

Amberg, Robert L., to Boeing Company, The. Limited-slip brake control system. 4,180,223, Cl. 244-111.000.

Amchem Products, Inc.: *See—*
Anderson, James D., 4,180,469, Cl. 252-149.000.

American Can Company: *See—*
Kuchenbecker, Morris W., 4,180,165, Cl. 206-461.000.
Mielke, Dennis L., 4,180,378, Cl. 425-83.100.

American Cyanamid Company: *See—*
Kapoor, Inder P., 4,180,679, Cl. 568-583.000.
Schaub, Robert E.; and Weiss, Martin J., 4,180,677, Cl. 562-500.000.
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,180,587, Cl. 424-315.000.
Whitman, Robert H.; and Barber, William A., 4,180,411, Cl. 106-41.000.

American Home Products Corp.: *See—*
Demerson, Christopher A.; and Humber, Leslie G., 4,180,580, Cl. 424-258.000.
Sarantakis, Dimitrios, 4,180,500, Cl. 260-112.50S.

American Hospital Supply Corporation: *See*—
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American Optical Corporation: *See*—
Persson, Staffan B.; and Buhler, Rato, 4,180,323, Cl. 356-3.000.
American Safety Equipment Corporation: *See*—
Ziv, Avraham, 4,180,283, Cl. 280-802.000.
Ammann, Eugene O., to GTE Sylvania Incorporated. Mode-locked optical parametric oscillator apparatus. 4,180,751, Cl. 307-428.000.
Ampex Corporation: *See*—
Louth, Kenneth; and Gallo, Luigi C., 4,180,701, Cl. 178-69.100.
AMSTED Industries Incorporated: *See*—
Bos, John A., 4,180,462, Cl. 210-351.000.
Day, John C., 4,179,995, Cl. 105-197.0DB.
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, to Commissariat a l'Energie Atomique. Process for the extraction of fission products. 4,180,476, Cl. 252-301.10W.
Anchor Post Products, Inc.: *See*—
Pfarr, Walter L., Jr., 4,180,247, Cl. 256-54.000.
Anderson, Colin C. Mechanical fencing machine. 4,180,245, Cl. 254-64.000.
Anderson, Grant W. Apparatus, methods and instruments for removing dental restorations. 4,179,816, Cl. 433-161.000.
Anderson, James D., to Amchem Products, Inc. Dithiocarbamate sulfonium salt inhibitor composition. 4,180,469, Cl. 252-149.000.
Anderson, John M., to General Electric Company. High intensity discharge lamp geometries. 4,180,763, Cl. 315-248.000.
Anderson, Kenneth M., to Medtronic, Inc. Lead connector for a body implantable stimulator. 4,180,078, Cl. 128-419.0PG.
Anderson Power Products, Inc.: *See*—
Eby, Richard L., 4,180,770, Cl. 324-429.000.
Andersson, Claes-Goran, to Wikings Mekaniska Verkstad AB. Dual inside/outside conveyors with separate drives. 4,180,154, Cl. 198-466.000.
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., to Vsesojuzny Gosudarstvenny Nauchno-Issiedovatelsky I Proekthyinstitut Khimo-Forograficheskoi Promyshlennosti. Process for obtaining half-tone picture of irregular structure. 4,180,402, Cl. 430-394.000.
Andreichikov, Boris I.: *See*—
Shumyakin, Evgeny P.; Sabir-de-Ribas, Konstantin I.; Druzhinsky, Isaak A.; Shishov, Gennady P.; and Andreichikov, Boris I., 4,180,435, Cl. 176-30.000.
Andrew, Malcolm S.; and Backhouse, Alan J., to Imperial Chemical Industries Limited. Coating composition. 4,180,489, Cl. 428-402.000.
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., to Du Pont de Nemours, E. I., and Company. Gas-barrier coated films, sheets or foils and method of preparation. 4,180,614, Cl. 428-336.000.
Aoki, Eiichiro: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, 4,179,972, Cl. 84-1.110.
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, to Kokkoman Shoyu Co., Ltd. Sealing structure for rotary valves. 4,180,188, Cl. 222-368.000.
Aoyama, Syunichi, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,180,033, Cl. 123-119.00A.
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Kingsley, Charles E., 4,180,045, Cl. 124-90.000.
Armstrong, Rolfe D.; and Lang, Charles R., Jr., to NCR Corporation. Selectively operable mask generator. 4,180,861, Cl. 364-900.000.
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Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, 4,180,026, Cl. 123-32.0EF.
Aronberg, Sue; and Fein, Gail. Headgear with eyeglass support. 4,179,753, Cl. 2-10.000.
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, to Foundation: The Research Institute for Special Inorganic Materials, The. Molybdenum base composite materials reinforced with continuous silicon carbide fibers and a method for producing the same. 4,180,399, Cl. 75-229.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, 4,180,652, Cl. 525-437.000.
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,180,404, Cl. 430-284.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro; and Sawada, Yoshio, 4,180,310, Cl. 354-24.000.
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, 4,180,309, Cl. 354-25.000.
Urano, Fumio; and Arai, Akihiro, 4,180,311, Cl. 354-53.000.
ASEA Aktiebolag: *See*—
Caisander, Yngve, 4,180,381, Cl. 432-157.000.
Ash, Eric A.: *See*—
Bennett, Simon D.; and Ash, Eric A., 4,179,936, Cl. 73-606.000.
Ashley, James E. Tag for identifying luggage and method of using same. 4,180,284, Cl. 283-20.000.
Aslund, Borje: *See*—
Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, 4,180,018, Cl. 122-225.00R.
Atari, Inc.: *See*—
Harrop, Geoffrey A. J., 4,180,267, Cl. 273-127.00R.
Atlantic Richfield Company: *See*—
Leonard, John J.; and Shalit, Harold, 4,180,681, Cl. 562-600.000.
Audi Nsu Auto Union Aktiengesellschaft: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.
Austin, William B.: *See*—
Bilow, Norman; and Austin, William B., 4,180,649, Cl. 528-245.000.
Automatik Apparate-Maschinenbau H. Hench GmbH: *See*—
Clarke, Kenneth, 4,180,539, Cl. 264-143.000.
Avco Corporation: *See*—
Ivanko, Theodore, 4,180,371, Cl. 415-115.000.
Avtec Industries, Inc.: *See*—
Helwig, William F., Jr., 4,180,744, Cl. 307-39.000.
Babbitt, Richard W., to United States of America, Army. Method for forming a drive hole in arc plasma spray fabricated ferrite phasors. 4,179,795, Cl. 29-602.00R.
Babcock & Wilcox Company, The: *See*—
Dopp, James W., 4,180,360, Cl. 409-287.000.
Babich, Vladimir A.: *See*—
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.
Babilon, Alfred: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.
Bach, Nicholas J.: *See*—
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,180,582, Cl. 424-261.000.
Backhouse, Alan J.: *See*—
Andrew, Malcolm S.; and Backhouse, Alan J., 4,180,489, Cl. 428-402.000.
Bagrosky, Michael E.: *See*—
Dulmaine, Joseph F.; and Bagrosky, Michael E., 4,179,914, Cl. 72-358.000.
Bailey, James R.: *See*—
Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., 4,180,712, Cl. 200-16.00D.
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., to NPI Corporation. Sandwich cooking and assembling unit. 4,179,985, Cl. 99-339.000.
Baker, Richard W.: *See*—
Heller, Jorge; and Baker, Richard W., 4,180,064, Cl. 128-130.000.
Bakgaard, Knud E., to Bang & Olufsen A/S. Loudspeaker motional feedback system. 4,180,706, Cl. 179-1.00F.
Baldt Incorporated: *See*—
Albertini, Rocco D., 4,179,878, Cl. 59-85.000.
Ball Corporation: *See*—
Sanford, Gary G., 4,180,817, Cl. 343-700.0MS.
Bamberger, Carlos E.; and Richardson, Donald M., deceased (by Richardson, Elizabeth B., executrix), to United States of America, Energy. Process for producing hydrogen from water using cobalt and barium compounds. 4,180,555, Cl. 423-657.000.
Bang & Olufsen A/S: *See*—
Bakgaard, Knud E., 4,180,706, Cl. 179-1.00F.
Bank Computer Network Corporation: *See*—
Fish, Leonard A.; and Mills, Duane M., 4,180,182, Cl. 221-75.000.
Barber-Colman Company: *See*—
Maxson, Dale E., 4,180,127, Cl. 165-76.000.
Barber, William A.: *See*—
Whitman, Robert H.; and Barber, William A., 4,180,411, Cl. 106-41.000.
Bargain, Michel; and Lefort, Marcel, to Rhone-Poulenc Industries. Organosilicon compounds with functional groups. 4,180,515, Cl. 260-448.20Q.
Bargigia, Gianangelo: *See*—
Caporiccio, Gerardo; Bargigia, Gianangelo; and Guidetti, Giampiero, 4,180,639, Cl. 526-243.000.
Barhorst, Ralph E., to Hobart Brothers Company. Welding power supply. 4,180,720, Cl. 219-130.510.
Barkan, Philip, to General Electric Company. Vacuum circuit breaker with delayed trip operation. 4,180,788, Cl. 335-190.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Lenk, Erich; and Bauer, Karl, 4,180,717, Cl. 219-10.49A.
Barnes, Roderick G. L., to Johnson, Matthey & Co., Limited. Luminescent materials. 4,180,477, Cl. 252-301.40R.
Barnett, David L., to Three Phoenix Company. Method and apparatus for polishing floppy discs. 4,179,852, Cl. 51-132.000.
Barnhardt, Kenneth O.; and Morita, Lawrence H. Trap and solids removal assembly for drains. 4,179,762, Cl. 4-191.000.
Barshak, Alexandr E.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valemin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.
Barth, Jordan B., to Colgate-Palmolive Company. Stable denture soak product. 4,180,467, Cl. 252-99.000.
Bartlett, Frank; and Franks, Allen R. Power regulating supply system for AC electrical loads. 4,180,745, Cl. 307-45.000.
Barton, Paul, to International Standard Electric Corporation. Multiple beam receiving array signal processor. 4,180,814, Cl. 343-5.0DP.
BASF Aktiengesellschaft: *See*—
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.
Kaufmann, Otto, 4,180,502, Cl. 260-145.00A.

Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.
Scholz, Herbert, 4,180,523, Cl. 260-573.000.
Schulze, Kurt, 4,180,481, Cl. 252-441.000.

Batdorf, Vernon H., to H. B. Fuller Company. Patching kit with aggregate and two-part epoxy binder system. 4,180,166, Cl. 206-568.000.

Bauder, Armin: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.

Bauer, Karl: *See*—
Lenk, Erich; and Bauer, Karl, 4,180,717, Cl. 219-10.49A.

Baur, Reinhold: *See*—
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.

Bausch & Lomb Incorporated: *See*—
Morton, Roger R. A.; and McCarthy, Cornelius J. D., 4,180,831, Cl. 358-160.000.

Bayer Aktiengesellschaft: *See*—
Behre, Horst; Putter, Rolf; and Steffan, Guido, 4,180,521, Cl. 260-505.00C.
Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, 4,180,438, Cl. 203-89.000.
Dollhausen, Manfred; Hohmann, Gerhard; and Behr, Winfried, 4,180,638, Cl. 526-204.000.
Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.
Mansmann, Manfred, 4,180,409, Cl. 106-39.600.
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, 4,180,617, Cl. 428-398.000.
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.
Selbeck, Harald; Dhein, Rolf; and Cohnen, Wolfgang, 4,180,493, Cl. 260-32.80N.
vor der Bruck, Dieter; and Wolfrum, Gerhard, 4,180,503, Cl. 260-152.000.

Beane, Frank T. Method of covering corrugated drainage tubes. 4,180,464, Cl. 210-497.00R.

Bear Brand Hosiery Co.: *See*—
Bowen, Omer J., 4,180,065, Cl. 128-165.000.

Beck, Harold D.; and Kolthoff, C. Paul, Jr., to International Harvester Company. Heat exchange apparatus including a toroidal-type radiator. 4,180,130, Cl. 165-124.000.

Beck, James R.; and Yahner, Joseph A., to Eli Lilly and Company. Control of phytopathogens with certain 2,6-dinitroanilines. 4,180,568, Cl. 424-226.000.

Becker, Frank C.; and Li, Jorge P., to Abbott Laboratories. Industrial biocides. 4,180,508, Cl. 260-326.50C.

Becker, Hubert: *See*—
Becker, Josef; Becker, Hubert; and Becker, Matthias, 4,180,219, Cl. 242-118.100.

Becker, Josef; Becker, Hubert; and Becker, Matthias. Lap creel comprising rod shaped carrier elements. 4,180,219, Cl. 242-118.100.

Becker, Matthias: *See*—
Becker, Josef; Becker, Hubert; and Becker, Matthias, 4,180,219, Cl. 242-118.100.

Beckmann, Karen L.: *See*—
Long, Wesley A., 4,179,781, Cl. 29-157.30R.

Becton, Dickinson and Company: *See*—
Hanley, John P.; Petrucci, Pasquale M.; and Pfeifer, Stanley, 4,180,091, Cl. 137-238.000.
Johnson, Lavell R., 4,180,383, Cl. 422-69.000.

Beduchaud, Michel: *See*—
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,180,824, Cl. 346-154.000.

Beecham Group Limited: *See*—
Goudie, Alexander C., 4,180,585, Cl. 424-311.000.

Behr, Winfried: *See*—
Dollhausen, Manfred; Hohmann, Gerhard; and Behr, Winfried, 4,180,638, Cl. 526-204.000.

Behre, Horst; Putter, Rolf; and Steffan, Guido, to Bayer Aktiengesellschaft. Process for the preparation of naphthalene-1,3,6-trisulphonic acid. 4,180,521, Cl. 260-505.00C.

Beier, Stefan: *See*—
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000.

Bell & Howell Company: *See*—
Langrehr, Larry L.; and Watson, Charles J., 4,180,321, Cl. 355-83.000.
Neff, Joseph J., deceased; and Neff, Lucille D., executrix, 4,180,839, Cl. 360-71.000.

Bell Laboratories, Inc.: *See*—
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., 4,180,757, Cl. 313-315.000.

Bell Telephone Laboratories, Incorporated: *See*—
Schiavone, Lawrence M., 4,180,602, Cl. 427-306.000.
Wagner Sigurd, 4,180,625, Cl. 429-111.000.

Bellco S.p.A.: *See*—
Calari, Alessandro, 4,180,460, Cl. 210-182.000.

Belliveau, Joseph W., Sr. Bicycle hitch for connection to a trailer. 4,180,279, Cl. 280-204.000.

Beloit Corporation: *See*—
Dahl, Carl B.; and Crouse, Jere W., 4,180,216, Cl. 242-66.000.

Bemba, Siegfried, to De Limon Fluhme GmbH & Co. 4/2 Way valve. 4,180,090, Cl. 137-119.000.

Ben-Haim, Haim. Automatic piston drive mechanism for use in caulking gun. 4,180,187, Cl. 222-326.000.

Bender, Hans: *See*—
Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.

Bendix Corporation, The: *See*—
Cresko, Joseph V.; and Moore, John A., 4,180,847, Cl. 362-30.000.
Johannesen, Donald D.; and Holcomb, Orla L., Jr., 4,180,149, Cl. 188-340.000.
Reddy, Junuthula N., 4,180,020, Cl. 123-32.0EA.
Richman, Jay L., 4,180,865, Cl. 365-63.000.
Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., 4,180,147, Cl. 188-71.800.

Benko, John M., to Pullman Incorporated. Flame cutting machine for modification of railway car side sills. 4,180,248, Cl. 266-67.000.

Bennett, John E.; and Elliott, Joseph E., to Diamond Shamrock Corporation. Oxygen selective anode. 4,180,445, Cl. 204-129.000.

Bennett, Simon D.; and Ash, Eric A., to National Research Development Corporation. Acoustic image recorders. 4,179,936, Cl. 73-606.000.

Berges, Jon F.; and Woolley, James M., to White Consolidated Industries, Inc. Dishwasher fill float. 4,180,085, Cl. 134-57.00D.

Berges, Jon F.: *See*—
Woolley, James M.; and Berges, Jon F., 4,180,095, Cl. 137-387.000.

Bernstein, Seymour: *See*—
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,180,587, Cl. 424-315.000.

Berry, D. Randolph: *See*—
Divers, Edward F.; Berry, D. Randolph; and Monaghan, David A., 4,180,352, Cl. 405-303.000.

Berry, William J.: *See*—
Echols, Robert B.; and Berry, William J., 4,179,991, Cl. 102-21.600.

Bertelson, George H. Above and below water and land pile cutting apparatus and method. 4,180,047, Cl. 125-14.000.

Bertsch, Paul J., to Primex Plastics Co. Foamed thermoplastic material laminated with a sheet-like covering material. 4,180,427, Cl. 156-272.000.

Bessette, Georges H. Apparatus for handling manure. 4,180,157, Cl. 198-747.000.

Betancourt, Victor M. Nasogastric catheters. 4,180,076, Cl. 128-349.00B.

Bettoli, Philip S., to GAF Corporation. Vinyl tile and production thereof. 4,180,615, Cl. 428-339.000.

Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., to McCain Manufacturing Co. Varying the drop of sheets into a hopper. 4,180,259, Cl. 271-200.000.

Bharteey, Brij M.: *See*—
Shariff, Sadiq A.; Bharteey, Brij M.; and Rowe, Neal E., 4,180,845, Cl. 361-334.000.

Bi, Le-Khac; and Milkovich, Ralph, to ARCO Polymers, Inc. Clear impact resistant thermoplastic star-block copolymers. 4,180,530, Cl. 525-98.000.

Bidwell, John L.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Bienvenu, Joseph O.; and Jagtap, Ashvinkumar N., to Petrolite Corporation. Polyvalent metal salts of oxidized and amidified waxes. 4,180,408, Cl. 106-31.000.

Bilow, Norman; and Austin, William B., to Hughes Aircraft Company. Homopolymerizable acetylene-terminated tetraimines and process for making same. 4,180,649, Cl. 528-245.000.

Binder, Dieter: *See*—
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,180,662, Cl. 544-48.000.

Bindicator Company: *See*—
Lundstrom, John W., 4,180,331, Cl. 356-445.000.

Birkenbach, Eugen J.; and Woodworth, Robert D., to International Harvester Company. Hydraulic angling mechanism for disc harrow gangs. 4,180,135, Cl. 172-407.000.

Bitjurin, Valentin A.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.

Bittler, Dieter: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.

Bivens, Jon A., to Toro Company, The. Retractable light fixture. 4,180,850, Cl. 362-285.000.

Bixby, James A., to Eastman Technology, Inc. Video recording and reproducing apparatus having variable reproduction speeds. 4,180,832, Cl. 360-10.000.

Blackburn, Charles M.: *See*—
Krishnan, Ravi C.; and Blackburn, Charles M., 4,180,153, Cl. 198-425.000.

Blair, Joe B.: *See*—
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.

Blais, Marcel H.: *See*—
Corna, John F.; and Blais, Marcel H., 4,179,761, Cl. 4-172.190.

Blake, William J., to Swanson, Robert L., a part interest. Coupling for telescoping members. 4,180,346, Cl. 403-109.000.

Bleha, Miroslav; and Plichta, Zdenek, to Ceskoslovenska Akademie ved. Polymers containing a reactive aromatic system based on p-phenylenediamine derivatives. 4,180,629, Cl. 521-65.000.

Blomberg, Richard N.: *See—*
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.

Bodensieck, Hans-Rudolf: *See—*
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.

Bodinger, Donald C.: *See—*
Snyder, Richard C.; and Bodinger, Donald C., 4,180,228, Cl. 248-74.00R.

Bodolay, William A. Packaging machine. 4,179,867, Cl. 53-568.000.

Boeding, David C.: *See—*
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., 4,180,133, Cl. 172-26.000.

Boehringer Ingelheim GmbH: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Boehringer Mannheim GmbH: *See—*
Kutter, Dolphe, 4,180,060, Cl. 128-760.000.

Boeing Company, The: *See—*
Amberg, Robert L., 4,180,223, Cl. 244-111.000.
Caley, Kenneth E.; and Trethewy, Brian R., 4,180,195, Cl. 227-51.000.
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., 4,180,605, Cl. 428-76.000.
Nelson, Donald J.; Pistoresi, Denis J.; and Weisbach, Michael F., 4,180,784, Cl. 331-94.5PE.
Stair, Leslie D., 4,180,362, Cl. 414-139.000.

Boelens, Martin: *See—*
Milliken, Ralph A.; Wall, Terence D.; and Boelens, Martin, 4,180,066, Cl. 128-205.240.

Boettcher, Fritz P.: *See—*
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.

Bohlander, Oskar: *See—*
Schumann, Erwin; and Bohlander, Oskar, 4,180,697, Cl. 13-25.000.

Bohm, Kurt: *See—*
Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, 4,180,018, Cl. 122-225.00R.

Boke, Karin: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Boller, Arthur: *See—*
Schadt, Martin; Scherrer, Hanspeter; and Boller, Arthur, 4,180,475, Cl. 252-299.000.

Bonse, Michael, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Carburetor for internal combustion engines. 4,180,533, Cl. 261-39.00A.

Boothby, Terry A.: *See—*
Hueil, J. Charles; Rothfuss, Robert G.; and Boothby, Terry A., 4,180,196, Cl. 227-109.000.

Borgerson, Newton H., Jr. Relocatable furniture system. 4,180,298, Cl. 312-242.000.

Borsig GmbH: *See—*
Drobka, Witold, 4,180,017, Cl. 122-34.000.

Borvendeg, Janos: *See—*
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.

Bos, John A., to AMSTED Industries Incorporated. Method and means for filtering liquids. 4,180,462, Cl. 210-351.000.

Bose Corporation: *See—*
Marshall, Neal H., 4,180,140, Cl. 181-156.000.

Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, to Fevrier-Decoisy-Champion. Thiodiglycol dibehenate and method of use. 4,180,492, Cl. 260-30.80R.

Bouverie, William M.; and Manas, Spero G., to Harris Corporation. Data acquisition for use in determining malfunctions of cylinders of an internal combustion engine. 4,179,922, Cl. 73-116.000.

Bovet, Thomas. Beach bag. 4,180,112, Cl. 150-1.700.

Bowen, Omer J., to Bear Brand Hosiery Co. Anti-embolism stocking. 4,180,065, Cl. 128-165.000.

Bradbury, Stanley A., to Cable Supports Limited. Cable clamps. 4,179,774, Cl. 24-132.00R.

Bradshaw, Phillip: *See—*
Forman, Donald B.; and Bradshaw, Phillip, 4,179,782, Cl. 29-268.000.

Braetsch, Hartmut: *See—*
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000.

Brammall, Inc.: *See—*
Gillette, Robert H., 4,179,850, Cl. 51-59.00R.
Gillette, Robert H., 4,179,855, Cl. 51-204.000.

Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the preparation of sump product. 4,180,438, Cl. 203-89.000.

Brandwein, Arthur. Tape splicing device and dispenser therefor. 4,180,181, Cl. 221-70.000.

Breant, Pierre L. V.; and Fresnel, Alain C., to U.S. Philips Corporation. System for measuring the speed of rotation of a synchro by means of a sampling technique. 4,180,859, Cl. 364-565.000.

Brem, Jacob. Method of treating pathological conditions of the nail. 4,180,058, Cl. 128-1.00R.

Breslau, Steven M., to Pace Photographic Products, Inc. Storage and dispensing device for film cartridges or the like. 4,180,192, Cl. 224-235.000.

Brick, Robert V.: *See—*
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., 4,180,725, Cl. 250-207.000.

Bridgestone Tire Company, Limited: *See—*
Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,180,631, Cl. 521-164.000.

Bristol-Myers Company: *See—*
Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., 4,180,658, Cl. 544-27.000.

Bristow, Elliott R. Well pump protection system. 4,180,374, Cl. 417-12.000.

British Petroleum Company Limited, The: *See—*
Davies, Evan E.; and Kolombos, Alexander J., 4,180,689, Cl. 585-407.000.

British Steel Corporation: *See—*
Naylor, David, 4,180,397, Cl. 75-58.000.

Broad Corporation: *See—*
Shurcliff, William A., 4,180,124, Cl. 165-1.000.

Brock, Geoffrey E., to International Business Machines Corporation. Thermal migration-porous silicon technique for forming deep dielectric isolation. 4,180,416, Cl. 148-1.500.

Brolin, Charles A.: *See—*
Joseph, George L.; and Brolin, Charles A., 4,180,421, Cl. 148-150.000.

Brooks, Nathaniel E. Maze game. 4,180,268, Cl. 273-153.00R.

Brooks, Parkman T.: *See—*
Marchant, Wayne N.; and Brooks, Parkman T., 4,180,628, Cl. 521-39.000.

Brown, Desmond J.: *See—*
Grigg, Geoffrey W.; and Brown, Desmond J., 4,180,576, Cl. 424-251.000.

Brown, John S.: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,179,985, Cl. 99-339.000.

Brown, John V., to Fosroc A.G. Method of anchoring a borehole anchor. 4,179,861, Cl. 52-743.000.

Brown, Maurice H. Terminal forming and installing apparatus. 4,179,785, Cl. 29-33.00K.

Brumbach, Joseph F.: *See—*
Murry, Edward J.; and Brumbach, Joseph F., 4,180,074, Cl. 128-276.000.

Brummer, Dietmar: *See—*
Weiler, Paul; and Brummer, Dietmar, 4,179,766, Cl. 15-250.320.
Weiler, Paul; and Brummer, Dietmar, 4,179,767, Cl. 15-250.320.

Bruno, Rocco, Jr: *See—*
Sevillano, Richard; and Bruno, Rocco, Jr, 4,180,142, Cl. 182-77.000.

Brunty, Fred. Multi-purpose labor saver hand tool. 4,179,828, Cl. 37-53.000.

Bryan, Steven R.: *See—*
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.

Buccicone, Dario, to Bucciconi Engineering Co. Magnetic sheet conveyor. 4,180,257, Cl. 271-193.000.

Bucciconi Engineering Co.: *See—*
Buccicone, Dario, 4,180,257, Cl. 271-193.000.

Buchner, Helmut; and Saeufferer, Helmut, to Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim. Method of cooling the interior of motor vehicles (powered at least partly by hydrogen). 4,179,896, Cl. 62-7.000.

Buckley, Keith; Vernon, Alan; and Lowe, Philip J., to Mars Limited. Food Protein Product. 4,180,592, Cl. 426-32.000.

Budzich, Tadeusz. Load responsive fluid control valve. 4,180,098, Cl. 137-596.130.

Buedel, Charles K., to GTE Automatic Electric Laboratories Incorporated. Direct memory access expander unit for use with a microprocessor. 4,180,855, Cl. 364-200.000.

Buelow, Fred K.; and Zasio, John J., to Fujitsu Limited. Large-scale integrated circuit with integral bi-directional test circuit. 4,180,772, Cl. 324-73.0PC.

Buhler, Rato: *See—*
Persson, Staffan B.; and Buhler, Rato, 4,180,323, Cl. 356-3.000.

Bunker Ramo Corporation: *See—*
Hutter, Harold G., 4,180,301, Cl. 339-90.00C.

Bunnig, C. Karl. Method for manufacturing glue for a binding agent in manufacture of chipboard or other cellulose products. 4,180,412, Cl. 106-124.000.

Burd, Lamar; and Donnelly, James K., to Howmet Turbine Components Corporation. Mold for directionally solidified single crystal castings and method for preparing same. 4,180,119, Cl. 164-34.000.

Burguette, Mario D., to Minnesota Mining and Manufacturing Company. Electron beam sensitive monomer. 4,180,673, Cl. 560-26.000.

Burkhard, Kurt; and Kunzmann, Peter, to Swiss Aluminium Ltd. Wear resistant coating for the working face of disc-shape machine parts made of aluminum or aluminum alloys. 4,180,622, Cl. 428-564.000.

Burnham, Lowell C., to General Electric Company. Vibration dampening support. 4,180,231, Cl. 248-632.000.

Burroughs Corporation: *See—*
Allan, James C., 4,180,840, Cl. 360-128.000.
Schwartz, Sidney J., 4,180,864, Cl. 365-6.000.
Shanks, Roy R., 4,180,866, Cl. 365-186.000.

Burrus, Harry O.; and Garnett, Donald I., to Du Pont de Nemours, E. I., and Company. Reaction of formaldehyde in butynediol. 4,180,687, Cl. 568-856.000.

Burson, David C., to Texas Instruments Incorporated. System for displaying character and graphic information on a color video display with unique multiple memory arrangement. 4,180,805, Cl. 340-709.000.

Butler Manufacturing Company: *See—*
Crump, Hubert C., 4,179,962, Cl. 83-300.000.

Butler, Walter J.: *See—*
Eichelberger, Charles W.; and Butler, Walter J., 4,180,807, Cl. 340-347.0AD.

Byrd, Norman R., to McDonnell Douglas Corporation. Electrodeposition of coatings on metals to enhance adhesive bonding. 4,180,442, Cl. 204-14.00N.

Cabeen, Robert P., III: *See—*
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.

Cable Supports Limited: *See—*
Bradbury, Stanley A., 4,179,774, Cl. 24-132.00R.

Caere Corporation: *See—*
Smith, William R., 4,180,799, Cl. 340-146.3AC.

Cahn, Arno: *See—*
Tokosh, Richard; and Cahn, Arno, 4,180,470, Cl. 252-121.000.

Cailloux, Philippe, to Compagnie Industrielle des Telecommunications Cit-Alcatel. System for supervising connection points. 4,180,801, Cl. 340-147.00R.

Caisander, Yngve, to ASEA Aktiebolag. Means for tilting crucible furnaces. 4,180,381, Cl. 432-157.000.

Calari, Alessandro, to Bellco S.p.A. Portable machine for regenerative dialysis. 4,180,460, Cl. 210-182.000.

Calderon, Reynaldo, to Reynaldo Calderon. Self-cleaning helical spring filter and methods. 4,180,463, Cl. 210-415.000.

Caley, Kenneth E.; and Trethewy, Brian R., to Boeing Company, The. Rivet delivery and locating apparatus. 4,180,195, Cl. 227-51.000.

Cambridge Consultants of Bar Hill: *See—*
McCombie, Alan K.; and Temple, Stephen, 4,180,194, Cl. 226-113.000.

Cameron Engineers, Inc.: *See—*
Sinor, Jerry E., 4,180,452, Cl. 208-8.0LE.

Canon Kabushiki Kaisha: *See—*
Hirata, Osamu; and Harada, Yuji, 4,180,711, Cl. 200-5.00A.
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.

Caporiccio, Gerardo; Bargigia, Gianangelo; and Guidetti, Giampiero, to Montedison S.p.A. Fluorosulphonyl oxafluoroalkanes, fluorosulphonyl olefines, their copolymers and processes for preparation. 4,180,639, Cl. 526-243.000.

Capps, Vidal D. Stationary forklift and method for use. 4,180,145, Cl. 187-17.000.

Carl Freudenberg, Firma: *See—*
Schultheiss, Wolfram; and Schmidt, Klaus, 4,180,611, Cl. 428-288.000.

Carl Schenck AG: *See—*
Dodt, Hans-Walter, 4,179,923, Cl. 73-134.000.

Carlisle, Richard S. Horticultural devices. 4,179,846, Cl. 47-59.000.

Carpenter, Roy B., Jr. System and equipment for atmospherics conditioning. 4,180,698, Cl. 174-2.000.

Carr, Albert A.; and Kinsolving, C. Richard, to Richardson-Merrell Inc. Olefinic 4-substituted piperidino derivatives as therapeutics. 4,180,583, Cl. 424-267.000.

Carr, John B., to Shell Oil Company. Lipogenesis control by esters of benzoxazinecarboxylic acids. 4,180,572, Cl. 424-248.550.

Carr, Keith E.; and Kimball, Vance A., to Whirlpool Corporation. Oven assembly air circulation system. 4,180,049, Cl. 126-21.00A.

Casals-Stenzel, Jorge: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.

Cashin Systems Corp.: *See—*
Dohm, Daniel, Jr., 4,179,987, Cl. 100-53.000.

Caspers, Karl-Heinz, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of alloying and/or inoculating and/or deoxidizing cast iron melts produced in a cupola furnace. 4,180,396, Cl. 75-53.000.

Caterpillar Tractor Co.: *See—*
Keske, Frank E.; and Hackett, David E., 4,179,952, Cl. 74-710.000.
Koeslin, Werner H., 4,179,884, Cl. 60-321.000.

Celanese Corporation: *See—*
Howell, Carl J., Jr.; Trott, David W.; and Riley, Jesse L., 4,180,536, Cl. 264-53.000.
Wrasman, Thomas J., 4,180,542, Cl. 264-242.000.

Central Glass Company, Limited: *See—*
Shibata, Toshiyuki; Ono, Hiroshi; and Isoyama, Kenji, 4,180,546, Cl. 423-178.000.

Cerrato, Vincent: *See—*
Zurit, David; Cerrato, Vincent; and Hines, James, 4,180,189, Cl. 222-400.700.

Ceskoslovenska Akademie ved: *See—*
Bleha, Miroslav; and Plichta, Zdenek, 4,180,629, Cl. 521-65.000.

Chakrabarti, Paritosh M.; and Hashem, Mohammed M., to GAF Corporation. Phosphoric acid esters of poly(2-10)ethyleneoxy n butane 1,4-diols. 4,180,532, Cl. 260-953.000.

Chammas, Edmond D., to Weatherford/DMC. Chemical cutting apparatus for use in wells. 4,180,131, Cl. 166-55.000.

Chandavoine, Marie-Madeleine: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Chang, Andrew K., to FMC Corporation. Angle measuring apparatus. 4,180,326, Cl. 356-152.000.

Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Conversion of synthesis gas to aromatic hydrocarbons. 4,180,516, Cl. 260-449.00R.

Chang, Kern K. N., to RCA Corporation. Flat cathode ray tube having magnetically collimated electron beam device. 4,180,760, Cl. 313-422.000.

Chapman, Charles C., to Phillips Petroleum Company. Alkylation process utilizing side draw vapor as heat source in isostripper. 4,180,526, Cl. 585-719.000.

Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., to Pitney Bowes Inc. Electronic postage metering system. 4,180,856, Cl. 364-466.000.

Chemie Linz Aktiengesellschaft: *See—*
Stern, Gerhard; and Dobramysl, Wilhelm, 4,180,488, Cl. 260-21.000.

Chesne, Andre: *See—*
Anav, Maurice; Chesne, Andre; Lescur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.

Chevron Research Company: *See—*
Lew, Henry Y., 4,180,650, Cl. 528-313.000.

Chiang, Yunn H., to Polaroid Corporation. Method for synthesizing acid blue 104. 4,180,513, Cl. 260-392.000.

Chicoye, Etzer; Helbert, J. Raymond; and Rice, James F., to Miller Brewing Company. Preparation of a bland beer. 4,180,589, Cl. 426-11.000.

Chignac, Michel: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Chikul, Olga S.: *See—*
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A. Fuel composition and process for producing same. 4,180,385, Cl. 44-62.000.

Chin, Edward: *See—*
Schwartz, Leonard; Chin, Edward; and Deveau, Emile J., 4,180,818, Cl. 343-700.0MS.

Chirico, Anthony N., to Ecodyne. Process for recovery of chemicals from saline water. 4,180,547, Cl. 423-197.000.

Chisso Corporation: *See—*
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.

Chloride Incorporated: *See—*
Malinowski, William J., 4,180,742, Cl. 250-574.000.

Chmovzh, Vadim E.: *See—*
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Choi, Nam S.; and Heller, Jorge, to Alza Corporation. Novel orthoester polymers and orthocarbonate polymers. 4,180,646, Cl. 528-153.000.

Chopra, Gopal M.: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,180,425, Cl. 149-95.000.

Chorvat, Robert J., to G. D. Searle & Co. 3,9-Dihydro-3,9-dioxo-2H-indeno(2,1-c)-pyridine-4-(carbonitriles/carboxamides). 4,180,666, Cl. 546-111.000.

Chrisp, Lynn E. Grain probe. 4,179,930, Cl. 73-425.200.

Chromalloy American Corporation: *See—*
Sjoberg, James G., 4,180,097, Cl. 137-516.290.

Chrysler Corporation: *See—*
Graham, Kenneth A., 4,179,925, Cl. 73-229.000.
Khair, Magdi K.; and McCombie, Jay C., 4,180,022, Cl. 123-32.0AE.
Tomczak, Lawrence W., 4,179,924, Cl. 73-229.000.

Cialone, David R.; and West, Donald L., to International Business Machines Corporation. Bi-directional, self imaging grating detection apparatus. 4,180,703, Cl. 250-237.00G.

Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, to Schweizerische Isola-Werke. Mica paper containing cellulose. 4,180,434, Cl. 162-138.000.

Ciba-Geigy Aktiengesellschaft: *See—*
Schwander, Hansrudolf; and Zickendraht, Christian, 4,180,665, Cl. 544-345.000.

Ciba-Geigy Corporation: *See—*
Garner, Robert, 4,180,656, Cl. 542-423.000.
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
Schmid, Rolf; and Kreibich, Ursula, 4,180,527, Cl. 525-115.000.
Siegrist, Adolf E.; Pauchard, Jean-Paul; and De Sousa, Bernardo, 4,180,479, Cl. 252-301.240.
Spivack, John D., 4,180,497, Cl. 260-45.8NT.

Spivack, John D., 4,180,498, Cl. 260-45.8NT.
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.

Cicatelli, Rodolfo, to Motorola, Inc. Positioning device of play-back heads and pressing devices in play-back and/or recording apparatus. 4,180,836, Cl. 360-130.320.

City of Hope National Medical Center: *See*—
Tiep, Brian L., 4,180,059, Cl. 128-721.000.

Clark, Calvin M., to Stanadyne, Inc. Variable tooth saw blade. 4,179,967, Cl. 83-846.000.

Clark, Edward J., to Tandy Brands, Inc. Belt without buckle. 4,179,755, Cl. 2-322.000.

Clark, Harold A., to International Business Machines Corporation. Process for etching SiO_2 layers to silicon in a moderate vacuum gas plasma. 4,180,432, Cl. 156-643.000.

Clark, Herbert J., to Thresher Institutes, Incorporated. Mole catcher. 4,179,836, Cl. 43-77.000.

Clark, Stephen C., III. Testing apparatus and method. 4,179,822, Cl. 35-9.00B.

Clarke, Kenneth, to Automatik Apparate-Maschinenbau H. Hench GmbH. Extrusion process for automatically threading laces. 4,180,539, Cl. 264-143.000.

Clarkson, Robert I.: *See*—
Schuller, Ronald A.; and Clarkson, Robert I., 4,179,920, Cl. 73-86.000.

Claxton, Gerald L., to Up-Right, Inc. Suspension system for harvester shaker member. 4,179,871, Cl. 56-330.000.

Claxton, William E., to Firestone Tire & Rubber Company, The. Tire deflection sensing method and apparatus. 4,180,794, Cl. 340-58.000.

Clearfield, Abraham, to Texas A&M University System. Modified zirconium phosphates. 4,180,551, Cl. 423-249.000.

Clement, Joseph J., to Mead Corporation, The. Shelf support structure. 4,180,003, Cl. 108-144.000.

Clewans, Bonnie. Liquid heating device. 4,180,722, Cl. 219-502.000.

Clifton, John L.: *See*—
Sandefur, Herbert G., 4,179,840, Cl. 43-131.000.

Clugston, George D. Step for vehicles. 4,180,143, Cl. 182-91.000.

Coast, John B., to Union Carbide Corporation. High speed bag folding machine. 4,180,256, Cl. 270-83.000.

Coburn Optical Industries, Inc.: *See*—
Neisler, Boyd L.; and Stith, Joe D., 4,179,851, Cl. 51-101.0LG.

Cochard, Roland: *See*—
Odone, Giovanni; and Cochard, Roland, 4,180,774, Cl. 324-125.000.

Coetzee, John C. Device for dispensing measured quantities of a liquid from a bottle. 4,180,106, Cl. 141-294.000.

Cohan, Allan N. Process for producing round spherical free flowing blown bead food products of controlled bulk density. 4,180,593, Cl. 426-72.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Unsaturated alcohols having an ether protected group. 4,180,682, Cl. 568-662.000.

Cohnen, Wolfgang: *See*—
Selbeck, Harald; Dhein, Rolf; and Cohnen, Wolfgang, 4,180,493, Cl. 260-32.80N.

Colgate-Palmolive Company: *See*—
Barth, Jordan B., 4,180,467, Cl. 252-99.000.

Collen, Desire J., to Leuven Research & Development V.Z.W. Purification of antiserum for thrombosis test. 4,180,437, Cl. 435-7.000.

Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., to Iowa State University Research Foundation, Inc. Guidance system for towed vehicles. 4,180,133, Cl. 172-26.000.

Commissariat a l'Energie Atomique: *See*—
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.

Commonwealth Scientific Industrial Research Organization: *See*—
Grigg, Geoffrey W.; and Brown, Desmond J., 4,180,576, Cl. 424-251.000.

Communications Patents Limited: *See*—
Gargini, Eric J., 4,180,748, Cl. 307-253.000.

Compagnie d'Etudes et de Realisations de Cybernetique: *See*—
Heitz, Pierre, 4,180,272, Cl. 277-28.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Allias, Bernard; and Decaudin, Charles, 4,179,807, Cl. 30-124.000.
Cailloux, Philippe, 4,180,801, Cl. 340-147.00R.
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,180,824, Cl. 346-154.000.

Comstock & Wescott, Inc.: *See*—
Rice, Richard E., 4,180,384, Cl. 44-52.000.

Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Coumarin derivatives to produce 8-methoxypsoralen. 4,180,659, Cl. 542-427.000.

Conner, Gary E., to United Technologies Corporation. Fail safe redundant actuator. 4,179,944, Cl. 74-89.150.

Conoco, Inc.: *See*—
Dodd, John R., 4,180,686, Cl. 568-730.000.
Oertle, Donald H.; and Peterson, Marvin L., 4,179,940, Cl. 73-808.000.

Conrow, Ransom B.: *See*—
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,180,587, Cl. 424-315.000.

Container Corporation of America: *See*—
Leavitt, David R.; and Pfieffer, Gerald R., 4,180,167, Cl. 206-622.000.
Wilkinson, James R., Sr., 4,180,200, Cl. 229-32.000.

Continental Group, Inc., The: *See*—
Hoenig, James R.; and Mallorca, Salvador C., 4,180,179, Cl. 220-307.000.

Cook, Charles C.; and Taplin, Harry R. Combustion process efficiency indicator. 4,179,921, Cl. 73-112.000.

Cook, James C., II, to Ford Motor Company. Apparatus for generating electrically distinguishable bipolar signals using a magnetic sensor and an oval wheel with teeth and notches in its minor and major axis. 4,180,753, Cl. 310-168.000.

Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., to Goodyear Aerospace Corporation. Ballistic armor system. 4,179,979, Cl. 89-36.00A.

Cook, Trix C., to Textron Inc. Display set-up pattern. 4,179,831, Cl. 40-19.500.

Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., to Eli Lilly and Company. 4-Oxa 2,6 diazabicycloheptane derivatives. 4,180,507, Cl. 260-245.400.

Coors Container Company: *See*—
Dulmaine, Joseph F.; and Bagrosky, Michael E., 4,179,914, Cl. 72-358.000.
Peck, Richard O., 4,180,844, Cl. 361-226.000.

Corna, John F.; and Blais, Marcel H. Wall construction for swimming pools. 4,179,761, Cl. 4-172.190.

Corning Glass Works: *See*—
Alpha, James W.; and Dumbaugh, William H., Jr., 4,180,618, Cl. 428-428.000.
Nixon, Roy A., Jr., 4,180,755, Cl. 313-113.000.
Szupillo, Raymond E., 4,180,723, Cl. 219-541.000.

Corrigan, John E. Fresh produce preservation. 4,179,900, Cl. 62-231.000.

Corson, Robert M., to GTE Sylvania Incorporated. Means for minimizing processing implosions in CRT manufacture. 4,179,778, Cl. 29-25.190.

Cosby, Billy Q., to National Service Industries, Inc. Binder post connection. 4,180,340, Cl. 402-63.000.

Cosgrove, James F.: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,180,259, Cl. 271-200.000.

Cosgrove, John D.; Pettis, Charles D.; and Mullett, Charles E., to International Tel Data Corporation. Data collection system using telephone lines. 4,180,709, Cl. 179-2.0AM.

Cotten, Soule E., to Du Pont de Nemours, E. I., and Company. Hatch cover closure system. 4,179,999, Cl. 105-377.000.

Coty, Alain: *See*—
Guyot, Pierre; Coty, Alain; and Delfau, Paul, 4,180,823, Cl. 346-139.00B.

Councilman, Clyde L.; and Shearer, Harry D., to E-Systems, Inc. Solid state digital running time indicator. 4,180,724, Cl. 235-92.00T.

Coy, David H.; and Kastin, Abba J. Bis (polypeptide) derivatives of enkephalin. 4,180,501, Cl. 260-112.50R.

Cozzens, Ray J.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Craig, Robert J. G., to Litton Systems, Inc. Tetrahedral redundant inertial reference unit. 4,179,818, Cl. 33-321.000.

Crawford, James E.; and Gray, Don N., to Owens-Illinois, Inc. Biocompatible articles having high permeability to gases derived from polysulfones. 4,179,757, Cl. 3-1.000.

Crawford, Thomas C., to Pfizer Inc. Ascorbic acid process. 4,180,511, Cl. 260-343.700.

Cresko, Joseph V.; and Moore, John A., to Bendix Corporation, The. Lighting display insensitive to extraneous light. 4,180,847, Cl. 362-30.000.

Crimeye Inc.: *See*—
Della-Calce, Louis D., 4,180,316, Cl. 354-173.000.

Crosspoint Latch Corp.: *See*—
Pires, H. George, 4,180,829, Cl. 358-10.000.

Crouse, Jere W.: *See*—
Dahl, Carl B.; and Crouse, Jere W., 4,180,216, Cl. 242-66.000.

Crowder, Billy L.; and Zirinsky, Stanley, to International Business Machines Corporation. Method for providing a metal silicide layer on a substrate. 4,180,596, Cl. 427-42.000.

Crump, Hubert C., to Butler Manufacturing Company. Combined flying cutoff and punch. 4,179,962, Cl. 83-300.000.

Culina, William; and Klus, Charles. Apparatus and methods for forming panels having scalloped cross-sections. 4,179,912, Cl. 72-196.000.

Cummins Engine Company, Inc.: *See*—
Heydrich, Hans, 4,179,892, Cl. 60-605.000.

Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Industry in Her Britannic Majesty's Government of the. Cranes. 4,180,171, Cl. 212-61.000.

Cushenbery, James D. Vehicle door and bumper lift. 4,180,252, Cl. 269-17.000.

Cutler, Alan B., to Revas, Inc. Apparatus for dispensing a fuel-air mixture in an airstream. 4,180,534, Cl. 261-41.00B.

Cutler-Hammer, Inc.: *See*—
Risberg, Robert L., 4,180,767, Cl. 318-308.000.

Cycles Peugeot: *See*—
Lacroix, Bernard, 4,180,743, Cl. 290-38.00B.

Dahl, Carl B.; and Crouse, Jere W., to Beloit Corporation. Winder with horizontal rider roll adjustment. 4,180,216, Cl. 242-66.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim: *See*—
Buchner, Helmut; and Saeufferer, Helmut, 4,179,896, Cl. 62-7.000.
Damsky, Arnold. Plug-in electrical receptacle extender. 4,180,303, Cl. 339-166.00R.
Dana Corporation: *See*—
Shea, Dennis W., 4,180,138, Cl. 180-65.00A.
Danford, Tiras J., to Harrington Manufacturing Company. Hinged eave assembly for a structure. 4,179,857, Cl. 52-71.000.
Danfoss A/S: *See*—
Hansen, Peter R.; and Thorsen, Niels P., 4,180,714, Cl. 200-81.00R.
Daniels Manufacturing Corp.: *See*—
Gooley, Marshall J., 4,179,956, Cl. 81-9.50R.
Danova, Cessare M. Method of making ceramic, sound-producing, ornamental article. 4,180,537, Cl. 264-62.000.
Darrow, George R., to Reynolds Metals Company. Method for coloring aluminum. 4,180,443, Cl. 204-35.00N.
Data Card Corporation: *See*—
LaManna, Richard J.; Drillick, Jacob H.; and Polad, Michael D., 4,180,338, Cl. 400-582.000.
Davidson, Murray R. Foot cushioning device. 4,179,826, Cl. 36-69.000.
Davies, David H.: *See*—
Mallams, Alan K.; and Davies, David H., 4,180,565, Cl. 424-180.000.
Davies, Evan E.; and Kolombos, Alexander J., to British Petroleum Company Limited, The. Process for converting C_3-C_{12} hydrocarbons to aromatics over gallia-activated zeolite. 4,180,689, Cl. 585-407.000.
Davies, Ronald W., to United Gas Industries Limited. Electrical controls for heating appliances. 4,180,380, Cl. 431-31.000.
Davis, Terri. Handbag. 4,180,111, Cl. 150-1.700.
Dawson, Carl B., Jr. Fail safe suspension poultry drinker. 4,180,015, Cl. 119-78.000.
Day, Edward: *See*—
Scudder, Roy, 4,179,873, Cl. 56-330.000.
Day, John C., to AMSTED Industries Incorporated. Snubbed railroad car truck. 4,179,995, Cl. 105-197.0DB.
De Limon Fluhme GmbH & Co.: *See*—
Bemba, Siegfried, 4,180,090, Cl. 137-119.000.
De Staat der Nederlanden, te dezen vertegenwoordigd door de directeur-generaal der Posterijen, Telegrafie en Telefonie: *See*—
Hagedoorn, Rijnder; and Koenderink, Ernest J. E., 4,180,843, Cl. 361-119.000.
Decaudin, Charles: *See*—
Allias, Bernard; and Decaudin, Charles, 4,179,807, Cl. 30-124.000.
DeCrescent, Ronald. System for measuring characteristics of an object's motion. 4,180,726, Cl. 250-222.00R.
Decuyper, Jean-Claude: *See*—
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,180,824, Cl. 346-154.000.
Deibele, Ludwig: *See*—
Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, 4,180,438, Cl. 203-89.000.
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., to International Business Machines Corporation. Anodic etching method for the detection of electrically active defects in silicon. 4,180,439, Cl. 204-1.00T.
Del, Joseph A. Process for making multi-layer printed circuit boards, and the article resulting therefrom. 4,180,608, Cl. 428-196.000.
Delfau, Paul: *See*—
Guyot, Pierre; Coty, Alain; and Delfau, Paul, 4,180,823, Cl. 346-139.00B.
Della-Calce, Louis D., to Crimeye Inc. Low noise automatic camera advance mechanism. 4,180,316, Cl. 354-173.000.
Delta Microfilm: *See*—
McCollough, John D., 4,180,320, Cl. 355-54.000.
Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corp. Furo(3,4-b)quinolines. 4,180,580, Cl. 424-258.000.
Dennis, Kent S., to Dow Chemical Company, The. Preparation of halophenylvinylbenzyl ethers. 4,180,680, Cl. 568-647.000.
Denu, Francis, to ADIDAS, Fabrique de Chaussures de Sport. Competition swimsuit. 4,179,754, Cl. 2-67.000.
Deptolla, Udo: *See*—
Fabinski, Walter; and Deptolla, Udo, 4,180,732, Cl. 250-344.000.
Derlien, Michael L., to Pye (Electronic Products) Limited. Apparatus for delivering fluids with controlled rates of flow. 4,180,067, Cl. 128-214.00F.
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, to Institut Francais du Petrole. Process for purifying a sulfur dioxide containing gas by washing with an ammonia aqueous solution. 4,180,550, Cl. 423-242.000.
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Siegrist, Adolf E.; Pauchard, Jean-Paul; and De Sousa, Bernardo, 4,180,479, Cl. 252-301.240.
Deutsche Gold- and Silber-Scheideanstalt Vormals Roessler: *See*—
Schumann, Erwin; and Bohlander, Oskar, 4,180,697, Cl. 13-25.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.
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Schwartz, Leonard; Chin, Edward; and Deveau, Emile J., 4,180,818, Cl. 343-700.0MS.
DeWitt, Robert E. Water sprinkler. 4,180,210, Cl. 239-97.000.
Dhein, Rolf: *See*—
Selbeck, Harald; Dhein, Rolf; and Cohnen, Wolfgang, 4,180,493, Cl. 260-32.80N.
Diamond International Corporation: *See*—
Harvey, Albert J., 4,180,105, Cl. 141-165.000.
Diamond, Ronald M.; Ling, Ku S.; and Winterer, Allen G., to Optical Coating Laboratory, Inc. Concentrator solar cell array module. 4,180,414, Cl. 136-89.0PC.
Diamond Shamrock Corporation: *See*—
Bennett, John E.; and Elliott, Joseph E., 4,180,445, Cl. 204-129.000.
Diaz, Stephen H., to Raychem Corporation. Tamper-proof closure system. 4,180,173, Cl. 215-6.000.
Diederich, David A., to Northland Group, Inc., The. Ice hockey stick. 4,180,413, Cl. 156-185.000.
DIEHL, Firma: *See*—
Meisner, Alfred; and Gerum, Erich, 4,180,087, Cl. 137-78.000.
Diehl, Ernst: *See*—
Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, 4,180,434, Cl. 162-138.000.
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., to Western Electric Co., Inc.; and Bell Laboratories, Inc. Incandescent lamp with vibration-protected filament mount. 4,180,757, Cl. 313-315.000.
Divers, Edward F.; Berry, D. Randolph; and Monaghan, David A., to United States of America, Interior. Extensible brattice and cantilevered roof mounted support system therefor. 4,180,352, Cl. 405-303.000.
Dixon, Kenneth W., to GAF Corporation. Preparation of insoluble polyvinylpyrrolidone. 4,180,633, Cl. 525-359.000.
Dixon, Rolland E., to Phillips Petroleum Company. Mixed-component refrigeration in shell-tube exchanger. 4,180,123, Cl. 165-1.000.
Dobramysl, Wilhelm: *See*—
Stern, Gerhard; and Dobramysl, Wilhelm, 4,180,488, Cl. 260-21.000.
Dr. Werner Freyberg: *See*—
Praxl, Werner; and Ehret, Reiner, 4,180,557, Cl. 424-10.000.
Dodd, John R., to Conoco, Inc. Oxidative coupling of alkylphenols. 4,180,686, Cl. 568-730.000.
Dodt, Hans-Walter, to Carl Schenck AG. Cradle mounted dynamometer. 4,179,923, Cl. 73-134.000.
Doherty, Daniel A.: *See*—
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., 4,180,640, Cl. 526-323.100.
Dohm, Daniel, Jr., to Cashin Systems Corp. Safety apparatus for a bacon press or the like. 4,179,987, Cl. 100-53.000.
Dollhausen, Manfred; Hohmann, Gerhard; and Behr, Winfried, to Bayer Aktiengesellschaft. Storable polychloroprene adhesives and a process for their production employing xanthogen disulphides. 4,180,638, Cl. 526-204.000.
Donnelly, James K.: *See*—
Burd, Lamar; and Donnelly, James K., 4,180,119, Cl. 164-34.000.
Dopp, James W., to Babcock & Wilcox Company, The. Broach pulling mechanism. 4,180,360, Cl. 409-287.000.
Doria, Andrea: *See*—
Raiteri, Angelo, 4,179,868, Cl. 53-571.000.
Doss, Richard C., to Phillips Petroleum Company. Adhesion promoter and method of preparation. 4,180,514, Cl. 428-417.000.
Dove, Ralph E. Removable mounted teeth in brush clearing saw. 4,180,108, Cl. 144-34.00F.
Doveri, Carlo, to Piaggio & C. S.p.A. Front-wheel suspension for two- or three-wheeled vehicles. 4,180,280, Cl. 280-277.000.
Dow Chemical Company, The: *See*—
Dennis, Kent S., 4,180,680, Cl. 568-647.000.
Evani, Syamalarao; and Raymond, Russell J., 4,180,637, Cl. 526-204.000.
Heikel, Henrik R., 4,180,449, Cl. 204-296.000.
Johnston, Howard; and Senkbeil, Herman O., 4,180,395, Cl. 71-94.000.
Moll, Norman G.; and Quarderer, George J., 4,180,456, Cl. 208-177.000.
Dragerwerk Aktiengesellschaft: *See*—
Pasternack, Adalbert, 4,180,235, Cl. 251-8.000.
Drain, Leslie E., to United Kingdom Atomic Energy Authority. Interferometer which corrects for spurious vibrations. 4,180,328, Cl. 356-349.000.
Dravo Corporation: *See*—
Jaquay, Louis H., 4,180,251, Cl. 266-172.000.
Drees, Herman M. Self-starting windmill energy conversion system. 4,180,367, Cl. 416-119.000.
Drews, Hilbert F. P. Propelled apparatus having surface means for developing increased propulsion efficiencies. 4,180,290, Cl. 296-1.00S.
Drillick, Jacob H.: *See*—
LaManna, Richard J.; Drillick, Jacob H.; and Polad, Michael D., 4,180,338, Cl. 400-582.000.
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., to Foxboro Company, The. Display station having universal module for interface with different single loop controllers. 4,180,860, Cl. 364-900.000.
Drobka, Witold, to Borsig GmbH. Pipe assembly-heat exchanger-steam drum unit. 4,180,017, Cl. 122-34.000.
Droz, Jean-Claude: *See*—
Lebet, Jean-Philippe; and Droz, Jean-Claude, 4,180,808, Cl. 340-384.00E.

Druzhinsky, Isaak A.: *See*—
Shumyakin, Evgeny P.; Sabir-de-Ribas, Konstantin I.; Druzhinsky, Isaak A.; Shishov, Gennady P.; and Andreichikov, Boris I., 4,180,435, Cl. 176-30.000.

Dufour, Raymond J.: *See*—
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,180,126, Cl. 165-59.000.

Duhrkoop, Jens; and Pusch, Gunter, to Industrie Automation GmbH & Co. Method of and device for scanning thermographic pictures. 4,180,306, Cl. 350-6.400.

Dulmaine, Joseph F.; and Bagrosky, Michael E., to Coors Container Company. Container with outwardly flexible bottom end wall having integral support means apparatus for manufacture thereof. 4,179,914, Cl. 72-358.000.

Dumbaugh, William H., Jr.: *See*—
Alpha, James W.; and Dumbaugh, William H., Jr., 4,180,618, Cl. 428-428.000.

Dunlop Limited: *See*—
Haines, Robert C., 4,180,263, Cl. 273-73.00G.

Du Pont de Nemours, E. I., and Company: *See*—
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.
Burrus, Harry O.; and Garnett, Donald I., 4,180,687, Cl. 568-856.000.
Cotten, Soule E., 4,179,999, Cl. 105-377.000.
Goddard, Steven J., 4,180,569, Cl. 424-226.000.
Hofmann, George H., 4,180,529, Cl. 525-85.000.
Inskip, Harold K., 4,180,620, Cl. 428-524.000.
McCormack, William B.; and Sandy, Charles A., 4,180,386, Cl. 44-63.000.
Nacci, George R.; and Pazos, Jose F., 4,180,403, Cl. 430-281.000.
Vassiliou, Eustathios, 4,180,609, Cl. 428-212.000.
Vassiliou, Eustathios, 4,180,613, Cl. 428-327.000.
Verma, Monica H., 4,180,610, Cl. 428-216.000.

Durden, Andrew; and Sorrell, Malcolm E., to Voltarc Tubes, Inc. Packaging arrangement for U-shaped fluorescent lamps. 4,180,164, Cl. 206-419.000.

Dutell, H. Gary: *See*—
Steffensen, Leslie M.; Dutell, H. Gary; and Rydell, Robert A., 4,179,820, Cl. 34-92.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Schmidt, Hans-Georg, 4,180,446, Cl. 204-158.00R.

E M I Limited: *See*—
Lee, Cyril A., 4,180,207, Cl. 235-493.000.

E. R. Squibb & Sons, Inc.: *See*—
Wade, Peter C.; and Vogt, Berthold R., 4,180,579, Cl. 424-258.000.

E-Systems, Inc.: *See*—
Councilman, Clyde L.; and Shearer, Harry D., 4,180,724, Cl. 235-92.00T.

Eads, William D.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Eagle Picher Industries, Inc.: *See*—
Romero, Victor R., 4,180,277, Cl. 280-79.300.

Early California Industries, Inc.: *See*—
Watts, James P., 4,180,350, Cl. 405-233.000.

Eastman Kodak Company: *See*—
Fagerburg, David R., 4,180,528, Cl. 525-70.000.
Frishberg, Mark D., 4,180,663, Cl. 544-105.000.

Eastman Technology, Inc.: *See*—
Bixby, James A., 4,180,832, Cl. 360-10.000.

Eaton Corporation: *See*—
Goscenski, Edward J., Jr., 4,179,888, Cl. 60-420.000.
Obermaier, Frank E., 4,180,208, Cl. 236-93.00B.

Eberle, William J., to General Battery Corporation. Cast-on method and apparatus for casting parts onto the lugs of lead-acid battery plates stacks. 4,180,120, Cl. 164-109.000.

Eby, Richard L., to Anderson Power Products, Inc. Method and apparatus for determining the capacity of lead acid storage batteries. 4,180,770, Cl. 324-429.000.

Echavarren, Daniel: *See*—
Echavarren, Luis A.; and Echavarren, Daniel, 4,179,763, Cl. 5-8.000.

Echavarren, Luis A.; and Echavarren, Daniel. Folding bunk bed unit. 4,179,763, Cl. 5-8.000.

Echols, Robert B.; and Berry, William J., to Titan Specialties, Inc. Perforating gun barrel. 4,179,991, Cl. 102-21.600.

Eckert, Alton B., Jr.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,180,856, Cl. 364-466.000.

Ecodyne: *See*—
Chirico, Anthony N., 4,180,547, Cl. 423-197.000.

Edington, Edwin T.; and White, Alan C., to John Wyeth & Brother Limited. Amino pyridine derivatives. 4,180,670, Cl. 546-284.000.

Edouard Dubied & Cie. (Societe Anonyme): *See*—
Patthey, Michel, 4,179,906, Cl. 66-128.000.

Ehret, Reiner: *See*—
Praxl, Werner; and Ehret, Reiner, 4,180,557, Cl. 424-10.000.

Eiber, Robert J.: *See*—
Park, Donald M.; and Eiber, Robert J., 4,180,104, Cl. 138-172.000.

Eichelberger, Charles W.; and Butler, Walter J., to General Electric Company. Charge transfer circuit with voltage threshold compensating means. 4,180,807, Cl. 340-347.0AD.

Einbinder, Itamar B.; and Hamilton, Albert A., to Western Electric Co., Inc. Methods of adjusting sealed contact switches. 4,179,798, Cl. 29-622.000.

Eisai Co., Ltd.: *See*—
Hamano, Sachiyuki; and Nakamura, Takaharu, 4,180,577, Cl. 424-251.000.

Electric Power Research Institute, Inc.: *See*—
Ho, Shih M.; and Gupta, Tapan K., 4,180,483, Cl. 252-518.000.
Saaski, Elric W., 4,179,927, Cl. 73-350.000.

Electron Fusion Devices Inc.: *See*—
Valukis, Robert W., 4,180,239, Cl. 251-60.000.

Eli Lilly and Company: *See*—
Beck, James R.; and Yahner, Joseph A., 4,180,568, Cl. 424-226.000.
Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., 4,180,507, Cl. 260-245.400.
Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., 4,180,564, Cl. 424-117.000.
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,180,582, Cl. 424-261.000.

Elliott, Joseph E.: *See*—
Bennett, John E.; and Elliott, Joseph E., 4,180,445, Cl. 204-129.000.

Emmons, William D., to Rohm and Haas Company. Radiation-curable coating compositions and method of coating metal substrates therewith. 4,180,598, Cl. 427-44.000.

Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., to Rohm and Haas Company. Polyurethane coating compositions from dicyclopentenyl acrylate and/or methacrylate. 4,180,645, Cl. 528-73.000.

Enck, Richard S., Jr.: *See*—
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., 4,180,725, Cl. 250-207.000.

Endo, Hiroshi; and Fujiki, Norio, to Nissan Motor Company, Limited. Testing circuit for radar-operated vehicle safety assurance systems. 4,180,816, Cl. 343-7.0VM.

Endo, Kunio: *See*—
Kobayashi, Akio; Endo, Kunio; and Omori, Norio, 4,180,023, Cl. 123-32.0EA.

Endo, Makoto, to Matsuzaka Company Ltd. Rotor of a coarse-reduction impact crusher. 4,180,213, Cl. 241-192.000.

Engel, Joseph C., to Westinghouse Electric Corp. Ground fault circuit interrupter with grounded neutral protection. 4,180,841, Cl. 361-45.000.

English Electric Valve Company Limited: *See*—
Harris, Jeffrey J.; and Rampling, Brian W., 4,180,759, Cl. 313-388.000.
Wheldon, Robert J.; and Neale, Christopher V., 4,180,756, Cl. 313-193.000.

Envirochem Inc.: *See*—
Paul, Donald G., 4,180,389, Cl. 55-28.000.

Ericson, John E., Jr., to Ericson Manufacturing Company. Ventilated lamp guard. 4,180,851, Cl. 362-378.000.

Ericson Manufacturing Company: *See*—
Ericson, John E., Jr., 4,180,851, Cl. 362-378.000.

Eriksen, Stuart P., to Interx Research Corporation. 3,4-Dipivalyl-α-[methylamino)methyl]benzyl alcohol as an adjunct in the treatment of circulatory shock. 4,180,586, Cl. 424-311.000.

Ernst Leitz Wetzlar GmbH: *See*—
Schmidt, Ewald; and Wiessner, Willi, 4,180,312, Cl. 354-59.000.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,180,702, Cl. 250-227.000.

Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,179,786, Cl. 29-407.000.

Eshima, Seiji: *See*—
Ogawa, Kiyohisa; and Eshima, Seiji, 4,180,160, Cl. 206-210.000.

Etablissements Huret & Ses Fils: *See*—
Huret, Roger H. M., 4,179,935, Cl. 73-493.000.

Evani, Syamalarao; and Raymond, Russell J., to Dow Chemical Company, The. Process for the preparation of low molecular weight anhydride interpolymers. 4,180,637, Cl. 526-204.000.

Ever Ready Company (Great Britain) Limited, The: *See*—
Parkin, Sidney J., 4,180,849, Cl. 362-72.000.

Exxon Research & Engineering Co.: *See*—
Luckenbach, Edward C., 4,180,454, Cl. 208-113.000.
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,180,548, Cl. 423-223.000.

Fa. Develop KG, Dr. Eisgein & Co.: *See*—
Kaufmann, Heinrich; and Moser, Kurt, 4,180,319, Cl. 355-3.00R.

Fabinski, Walter; and Deptolla, Udo, to Hartmann & Braun Aktiengesellschaft. Nondispersive infrared gas analyzer. 4,180,732, Cl. 250-344.000.

Fackelmann, Peter. Protective suit. 4,179,752, Cl. 2-2.000.

Fagan, Maurice J., Jr.; and Fagan, Maurice J., III. Dental implant. 4,179,809, Cl. 433-176.000.

Fagan, Maurice J., III: *See*—
Fagan, Maurice J., Jr.; and Fagan, Maurice J., III, 4,179,809, Cl. 433-176.000.

Fagerburg, David R., to Eastman Kodak Company. Block copolymer composed of an addition polymer and a linear saturated polyester. 4,180,528, Cl. 525-70.000.

Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Trans-halo(acyl)bis(triethylphosphine) nickel(II) complexes. 4,180,525, Cl. 585-523.000.

Fahey, William D.: *See—*
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.

Faine, Eric N. Gardening tool. 4,180,289, Cl. 294-53.500.

Falk, Richard A.: *See—*
Moriya, Kazuo, 4,179,931, Cl. 73-425.600.

Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, to Fallon, John J., Jr.; and Ritt, Donald. Multiple furnace waste heat recovery system. 4,180,128, Cl. 165-76.000.

Farcinade, Michel, to Alcyon Equipment S.A. Interior measurement of enclosed spaces. 4,180,322, Cl. 356-1.000.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 4,180,692, Cl. 585-457.000.

Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., to United Technologies Corporation. Premix combustor assembly. 4,179,881, Cl. 60-39.710.

Faulkner, Alfred H. Automatic arpeggio for multiplexed keyboard. 4,179,970, Cl. 84-1.030.

Fauls, Thomas J., to Mego Corp. Audible sound emitting toy. 4,179,842, Cl. 46-117.000.

Fauve, Robert, to Institut Pasteur. Immunostimulant agent from *Salmonella typhimurium* or *Listeria monocytogenes* bacterial cells and pharmaceutical composition. 4,180,563, Cl. 424-92.000.

Federal-Mogul Corporation: *See—*
Ladin, Eli M.; and Reynolds, Mark P., 4,179,780, Cl. 29-149.50R.

Fehlisch, Silvan: *See—*
Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.

Fehrenkamp, William. Method and apparatus for producing programmable selection of music. 4,180,838, Cl. 360-63.000.

Fein, Gail: *See—*
Aronberg, Sue; and Fein, Gail, 4,179,753, Cl. 2-10.000.

Feldstein, Nathan, to Feldstein, Nathan. Process using activated electroless plating catalysts. 4,180,600, Cl. 427-97.000.

Feldstein, Robert S., to Abex Corporation. Electronic siren. 4,180,809, Cl. 340-384.00E.

Fell, Markley D.: *See—*
Hopping, Alvin S., deceased; and Johnson, Clifford A., executor, 4,179,885, Cl. 60-370.000.

Feng, Bai-Cwo; and Feng, George C., to International Business Machines Corporation. Two layer resist system. 4,180,604, Cl. 430-270.000.

Feng, George C.: *See—*
Feng, Bai-Cwo; and Feng, George C., 4,180,604, Cl. 430-270.000.

Ferraro, Angelo, to Tele/Resources, Incorporated. Energy limiting foldback circuit for power supply. 4,180,768, Cl. 323-9.000.

Ferrero, Elvio: *See—*
Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, 4,179,839, Cl. 43-112.000.

Fevrier-Decoisy-Champion: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, to Volkswagenwerk AG. Motor-driven heat pump. 4,179,901, Cl. 62-238.000.

Fiat Societa per Azioni: *See—*
Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, 4,179,839, Cl. 43-112.000.

Fiber Industries, Inc.: *See—*
Gibbon, John D., 4,179,875, Cl. 57-248.000.

Fibra-Sonics, Inc.: *See—*
Murry, Edward J.; and Brumbach, Joseph F., 4,180,074, Cl. 128-276.000.

Fichtel & Sachs AG: *See—*
Wagner, Gerolf, 4,180,137, Cl. 180-33.00R.

Fiedler, Frank, Jr. Solenoid operated valve and shut-off device. 4,180,241, Cl. 251-130.000.

Filippi, Richard E.: *See—*
Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., 4,179,897, Cl. 62-9.000.

Finlay, Glenn. Grating fastener. 4,180,343, Cl. 403-24.000.

Firestone Tire & Rubber Company, The: *See—*
Claxton, William E., 4,180,794, Cl. 340-58.000.
Hergenrother, William J.; and Halasa, Adel F., 4,180,647, Cl. 528-168.000.

Firth, Donald: *See—*
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,180,171, Cl. 212-61.000.

Fischer Gesellschaft m.b.H.: *See—*
Staufer, Adolf, 4,180,265, Cl. 273-73.00D.

Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, to BASF Aktiengesellschaft. Continuous manufacture of unsaturated polyesters. 4,180,635, Cl. 526-68.000.

Fish, Leonard A.; and Mills, Duane M., to Bank Computer Network Corporation. Dispensing magazine. 4,180,182, Cl. 221-75.000.

Fisher Scientific Company: *See—*
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., 4,180,440, Cl. 204-1.00T.

Fitzgerald-Smith, James P.; and Knight, Derek I., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Pontoon launching. 4,180,364, Cl. 414-350.000.

Flaum, Dennis M.; and Fleishman, Herman L. Vacuum bag process and apparatus. 4,180,190, Cl. 223-43.000.

Flavin, Thomas R.: *See—*
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Fleishman, Herman L.: *See—*
Flaum, Dennis M.; and Fleishman, Herman L., 4,180,190, Cl. 223-43.000.

Florer, Richard H.; Via, Thomas E.; and Weaver, James M., to Lambert Corporation. Fertilizer spreader. 4,180,184, Cl. 222-41.000.

Floyd, Don E., to Henkel Corporation. Epoxy curable resin composition. 4,180,487, Cl. 260-18.00N.

FMC Corporation: *See—*
Chang, Andrew K., 4,180,326, Cl. 356-152.000.
Joseph, George L.; and Brolin, Charles A., 4,180,421, Cl. 148-150.000.
Mencacci, Samuel A., 4,179,986, Cl. 99-359.000.

Focke, Heinz, to Focke & Pfuhl. Apparatus for setting and shaping glued cigarette packs. 4,179,864, Cl. 53-388.000.

Focke, Heinz, to Focke & Pfuhl. Pack and blank for making the pack and web of packing material for making the blanks. 4,180,201, Cl. 229-37.00R.

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Focke, Heinz, 4,179,864, Cl. 53-388.000.
Focke, Heinz, 4,180,201, Cl. 229-37.00R.

Forcina, John. Anchoring nail. 4,179,975, Cl. 85-23.000.

Ford Motor Company: *See—*
Cook, James C., II, 4,180,753, Cl. 310-168.000.
Gordon, Thomas C., 4,180,302, Cl. 339-143.00T.

Forenade Fabriksverken: *See—*
Gronvall, Karl O. R., 4,179,891, Cl. 60-521.000.

Forman, Donald B.; and Bradshaw, Phillip, to United States of America, Navy. Cable terminal-ferrule attaching apparatus. 4,179,782, Cl. 29-268.000.

Fort, Emil M.; and Albaric, Jacques E., to Westinghouse Electric Corp. Double ring and radial conductor assembly for large hollow shafts. 4,180,300, Cl. 339-5.00R.

Forward, Robert L.; and Thurmond, Gary D., to Hughes Aircraft Company. Impedance-matching circuit using negative low-noise resistance. 4,180,786, Cl. 333-32.000.

Fosroc A.G.: *See—*
Brown, John V., 4,179,861, Cl. 52-743.000.

Foster Wheeler Energy Corporation: *See—*
Reale, Salvatore J., 4,179,860, Cl. 52-732.000.

Fotescu, Leonida: *See—*
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.

Foundation: The Research Institute for Special Inorganic Materials, The: *See—*
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, 4,180,399, Cl. 75-229.000.

Foxboro Company, The: *See—*
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., 4,180,860, Cl. 364-900.000.

Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, to Institut Francais du Petrole. Process for the steam-cracking of heavy feedstocks. 4,180,453, Cl. 208-57.000.

Franckowiak, Sigismond: *See—*
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 4,180,550, Cl. 423-242.000.

Franklin, Michael L.: *See—*
Goldberg, Arthur H.; and Franklin, Michael L., 4,180,558, Cl. 424-16.000.

Franks, Allen R.: *See—*
Bartlett, Frank; and Franks, Allen R., 4,180,745, Cl. 307-45.000.

Franz, John E.; and Kaufman, Robert J., to Monsanto Company. Derivatives of N-trifluoroacetyl-N-phosphonomethylglycinates and the herbicidal use thereof. 4,180,394, Cl. 71-86.000.

Frederick, Roderick J. Conveyor assembly for use in check out stands. 4,180,158, Cl. 198-831.000.

Frehn, Fritz, to Thyssen Edelstahlwerke Aktiengesellschaft. Sintered steel alloy. 4,180,401, Cl. 75-236.000.

Freiedrich Wilhem, Schwing GmbH: *See—*
Meinken, Bernhard, 4,180,170, Cl. 212-1.000.

Fresnel, Alain C.: *See—*
Breant, Pierre L. V.; and Fresnel, Alain C., 4,180,859, Cl. 364-565.000.

Fresnel, Jacques. Apparatus for sectioning thermoplastic sheath and placing resulting sleeves around containers. 4,179,863, Cl. 53-295.000.

Freund, Edouard: *See—*
Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, 4,180,453, Cl. 208-57.000.

Fricko, John J.; and Newton, George M., to General Motors Corporation. Molding retaining clip. 4,179,859, Cl. 52-397.000.

Fries, Carl, Jr., to International Paper Company. Apparatus and method for automatically dispensing flexible containers. 4,180,180, Cl. 221-1.000.

Frishberg, Mark D., to Eastman Kodak Company. Methine dye synthesis. 4,180,663, Cl. 544-105.000.

Frissora, Joseph R., to Owens-Illinois, Inc. Solar energy operated system and method. 4,180,209, Cl. 237-1.00A.

Fritschi, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, to Ludwig Heumann, & Co. GmbH. 2,4-Diamino-5-(4'-methylthio)benzylpyrimidenes, compounds, compositions and method of use. 4,180,578, Cl. 424-251.000.

Fritts, David H., to United States of America, Air Force. Method of molding a double cathode having a sensing grid for a porous electrode primary battery. 4,179,799, Cl. 29-623.500.
Fromuth, Harry C.; and Shell, Kenneth M., to Rohm and Haas Company. Thermoplastic polyesters. 4,180,494, Cl. 260-40.00R.
Fudenberg, Herman H.: *See*—
Klesius, Phillip H.; and Fudenberg, Herman H., 4,180,627, Cl. 435-262.000.
Fuji Electric Co., Ltd.: *See*—
Ueda, Shinya, 4,180,733, Cl. 250-345.000.
Fuji Photo Film Co., Ltd.: *See*—
Inuiya, Masafumi, 4,180,313, Cl. 354-112.000.
Fujiki, Miyoji: *See*—
Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, 4,180,185, Cl. 222-57.000.
Fujiki, Norio: *See*—
Endo, Hiroshi; and Fujiki, Norio, 4,180,816, Cl. 343-7.0VM.
Fujisoku Electric Co., Ltd.: *See*—
Suzuki, Hideo, 4,180,716, Cl. 200-320.000.
Fujita, Susumu, to Nittan Kohki Co., Ltd. Adjustable clamping device. 4,179,775, Cl. 24-249.00R.
Fujitsu Limited: *See*—
Buelow, Fred K.; and Zasio, John J., 4,180,772, Cl. 324-73.0PC.
Fukui, Seiji: *See*—
Hanada, Mitsugu; and Fukui, Seiji, 4,179,953, Cl. 74-750.00B.
Furh, Karl: *See*—
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.
Furstenberg, Joachim, to LTG Lufttechnische GmbH. Textile machine including air cleaning apparatus. 4,180,390, Cl. 55-272.000.
Fushimi, Kenji: *See*—
Koyanagi, Shunichi; Shimizu, Toshihide; and Fushimi, Kenji, 4,180,634, Cl. 526-62.000.
G. D. Searle & Co.: *See*—
Chorvat, Robert J., 4,180,666, Cl. 546-111.000.
G. Siempelkamp GmbH & Co.: *See*—
Huydts, Eduard J. C., 4,179,915, Cl. 72-402.000.
Gabrielidis, Pericles. Tennis serving toss aid. 4,180,262, Cl. 273-29.00A.
Gabrielli, Ernesto. Method of extruding employing an extrusion device having intermediate extruder. 4,180,541, Cl. 264-171.000.
GAF Corporation: *See*—
Bettoli, Philip S., 4,180,615, Cl. 428-339.000.
Chakrabarti, Paritosh M.; and Hashem, Mohammed M., 4,180,532, Cl. 260-953.000.
Dixon, Kenneth W., 4,180,633, Cl. 525-359.000.
Gaines, Larry D.; and Giles, Richard F., to Phillips Petroleum Company. Purge control for ammonia synthesis process. 4,180,858, Cl. 364-502.000.
Galer, Herbert W., to United States Steel Corporation. Gravity dump shipping crate for poultry. 4,180,176, Cl. 217-57.000.
Gallagher, Edward: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,180,259, Cl. 271-200.000.
Gallo, Luigi C.: *See*—
Louth, Kenneth; and Gallo, Luigi C., 4,180,701, Cl. 178-69.100.
Gamba, Vittorio. Mechanical torque converter. 4,179,943, Cl. 74-64.000.
Gang, Robert E., to Varian Associates, Inc. Superconducting solenoid with compensation for axial gradients. 4,180,769, Cl. 324-319.000.
Gardiner-Romero, Joanne L.: *See*—
Romero, Frank; and Gardiner-Romero, Joanne L., 4,180,054, Cl. 126-164.000.
Gargini, Eric J., to Communications Patents Limited. Electronic solid state switching device. 4,180,748, Cl. 307-253.000.
Garner, Robert, to Ciba-Geigy Corporation. Azomethine compounds. 4,180,656, Cl. 542-423.000.
Garnett, Donald I.: *See*—
Burrus, Harry O.; and Garnett, Donald I., 4,180,687, Cl. 568-856.000.
Gas Developments Corporation: *See*—
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,180,126, Cl. 165-59.000.
Gates, Harlan R., to International Business Machines Corporation. NPN/PNP Fabrication process with improved alignment. 4,180,827, Cl. 357-44.000.
Gattner, Hans: *See*—
Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, 4,180,575, Cl. 424-250.000.
Gauron, Richard F. Restraining apparatus for bookcases. 4,179,848, Cl. 49-124.000.
Gebrueder Heller Maschinenfabrik GmbH: *See*—
Schmid, Karlheinz, 4,180,359, Cl. 409-197.000.
Gedeon, Andras, to Siemens Aktiengesellschaft. Gas analyzer. 4,180,734, Cl. 250-345.000.
Geidies, Ulrich, to Krupp-Koppers GmbH. Piston pump for use in gasifying fine grained and dust-like solid fuels. 4,180,353, Cl. 406-74.000.
Gelardi, Anthony L. Tape splicing device. 4,180,431, Cl. 156-505.000.
Gelenkwellenbau GmbH: *See*—
Schultenkamper, Josef, 4,179,905, Cl. 64-17.00A.
Gelman, Charles S. Envelope sealing device. 4,180,430, Cl. 156-441.500.
General Battery Corporation: *See*—
Eberle, William J., 4,180,120, Cl. 164-109.000.
General Electric Company: *See*—
Abrams, Donald W., 4,180,297, Cl. 312-214.000.
Anderson, John M., 4,180,763, Cl. 315-248.000.
Barkan, Philip, 4,180,788, Cl. 335-190.000.
Burnham, Lowell C., 4,180,231, Cl. 248-632.000.
Eichelberger, Charles W.; and Butler, Walter J., 4,180,807, Cl. 340-347.0AD.
Herbst, LeRoy J.; and Jenkins, Thomas E., 4,179,821, Cl. 34-235.000.
Keeney, Marvin F., 4,180,842, Cl. 361-85.000.
Kingsley, Jack D., 4,180,737, Cl. 250-367.000.
Kirkpatrick, Robert G.; and Snyder, Ronald R., 4,179,978, Cl. 89-12.000.
Lederman, Frank L.; and Tiemann, Jerome J., 4,180,792, Cl. 367-7.000.
MacLaury, Michael R., 4,180,685, Cl. 568-726.000.
Mark, Victor, 4,180,651, Cl. 528-202.000.
Mitchell, Lawrence C., 4,180,683, Cl. 568-724.000.
Pauze, Denis R.; and Pucci, Donald G., 4,180,612, Cl. 528-289.000.
Thomas, Charles E., 4,180,790, Cl. 367-7.000.
Tiemann, Jerome J., 4,180,791, Cl. 367-105.000.
Vakil, Himanshu B., 4,179,898, Cl. 62-114.000.
General Motors Corporation: *See*—
Fricko, John J.; and Newton, George M., 4,179,859, Cl. 52-397.000.
Vogelsberg, William A., 4,180,034, Cl. 123-119.00A.
General Research of Electronics, Inc.: *See*—
Nakano, Masao, 4,180,819, Cl. 343-792.000.
General Signal Corporation: *See*—
Peabody, Frederick H., Jr., 4,179,903, Cl. 62-322.000.
Genese, Joseph N., to Abbott Laboratories. Disposable double vial syringe. 4,180,070, Cl. 128-218.00M.
George, William M. Safety pet collar. 4,180,016, Cl. 119-106.000.
Georgia-Pacific Corporation: *See*—
Steffensen, Leslie M.; Dutell, H. Gary; and Rydell, Robert A., 4,179,820, Cl. 34-92.000.
Geosource, Inc.: *See*—
Schuller, Ronald A.; and Clarkson, Robert I., 4,179,920, Cl. 73-86.000.
Gerlinger, Frederic, to Kuhn, S.A. Haymaking machine for central tedding and lateral windrowing. 4,179,872, Cl. 56-366.000.
Gerum, Erich: *See*—
Meisner, Alfred; and Gerum, Erich, 4,180,087, Cl. 137-78.000.
Gestetner Limited: *See*—
Maynard, Michael; and Jones, Walter, 4,180,621, Cl. 428-535.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Lobbe, Armin; and Penzek, Hans-Jurgen, 4,180,291, Cl. 299-34.000.
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., to Indian Explosives Limited. Gelatine explosive compositions. 4,180,425, Cl. 149-95.000.
Gibbon, John D., to Fiber Industries, Inc. High tenacity, low denier poly(ethylene terephthalate) fibrillated tape yarn. 4,179,875, Cl. 57-248.000.
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., to Fisher Scientific Company. Variable endpoint analyzer. 4,180,440, Cl. 204-1.00T.
Gibson, Donald M.; and Pierce, Donald C. Ink for application to unglazed paper surfaces. 4,180,407, Cl. 106-26.000.
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., to Boeing Company, The. Multilayer radome. 4,180,605, Cl. 428-76.000.
Giles, Richard F.: *See*—
Gaines, Larry D.; and Giles, Richard F., 4,180,858, Cl. 364-502.000.
Gillette Company, The: *See*—
Lebet, Jean-Philippe; and Droz, Jean-Claude, 4,180,808, Cl. 340-384.00E.
Sastri, Suri A.; and Alexander, Ben H., 4,180,420, Cl. 148-37.000.
Gillette, Robert H., to Brammall, Inc. Reaction honing tool for honing a flat surface. 4,179,850, Cl. 51-59.00R.
Gillette, Robert H., to Brammall, Inc. Insert for honing tool. 4,179,855, Cl. 51-204.000.
Ginnow, Oscar; and Ginnow, Roger. Sensor for determining band saw deflection and for guiding the band saw blade. 4,179,966, Cl. 83-820.000.
Ginnow, Roger: *See*—
Ginnow, Oscar; and Ginnow, Roger, 4,179,966, Cl. 83-820.000.
Ginter, Tom, Jr. Exhaust pipe safety clamp assembly and combination. 4,180,286, Cl. 285-328.000.
Girard, Philip R.: *See*—
Koenig, Richard W.; Girard, Philip R.; and Neuhauser, Alfred J., 4,180,204, Cl. 235-385.000.
Giuffra, William E. Interlocked battery jumper cable assembly. 4,180,746, Cl. 307-127.000.
Givens, Wyatt W., to Mobil Oil Corporation. Gamma-gamma density logging method. 4,180,727, Cl. 250-264.000.
Givens, Wyatt W., to Mobil Oil Corporation. Uranium logging in earth formations. 4,180,729, Cl. 250-265.000.
Givens, Wyatt W.; and Mills, William R., Jr., to Mobil Oil Corporation. Logging technique for assaying for uranium in earth formations. 4,180,730, Cl. 250-265.000.
Givens, Wyatt W., to Mobil Oil Corporation. Radioactive logging sonde including means for monitoring neutron source output. 4,180,731, Cl. 250-270.000.
Glass, Roger W.; and Kuntze, Richard A., to Ontario Research Foundation. Production of improved chrysotile asbestos fibres. 4,180,433, Cl. 162-3.000.
Gmeinder, Hermann: *See*—
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000.

Goddard, Steven J., to Du Pont de Nemours, E. I., and Company. Seed treatment fungicides for control of seed-borne diseases. 4,180,569, Cl. 424-226.000.

Goddin, Clifton S., Jr.; and Palm, John W., to Standard Oil Company (Indiana). Method for removal of sulfur deposited on a Claus catalyst. 4,180,554, Cl. 423-574.00R.

Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., to Eli Lilly and Company. A-38533 Antibiotics and process for production thereof. 4,180,564, Cl. 424-117.000.

Goehner, Ronald H.: *See—*
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., 4,180,725, Cl. 250-207.000.

Goertz, LeRoy E., to Sunkist Growers, Inc. Flow diverting gate for conveyors. 4,180,151, Cl. 198-367.000.

Goldberg, Arthur H.; and Franklin, Michael L., to Hoffmann-La Roche Inc. Unit dosage forms. 4,180,558, Cl. 424-16.000.

Goldsmith, Arthur C.: *See—*
Kirkgasser, James P.; and Goldsmith, Arthur C., 4,179,964, Cl. 83-599.000.

Goldstein, Norman P.; and Smith, Richard C., to Westinghouse Electric Corp. Neutron activation probe for measuring the presence of uranium in ore bodies. 4,180,728, Cl. 250-264.000.

Gondek, John T. Control circuit for hydraulic cylinder and shaft assembly. 4,179,889, Cl. 60-477.000.

Gonzales, Boris, to Societe Anonyme Automobiles Citroen. Switch control unit for automobile vehicle. 4,180,713, Cl. 200-52.00R.

Goodman, Charles D., to United States of America, Energy. Use of a large time-compensated scintillation detector in neutron time-of-flight measurements. 4,180,736, Cl. 250-363.00R.

Goodwood Data Systems Ltd.: *See—*
Price, Ronald, 4,179,939, Cl. 73-730.000.

Goodyear Aerospace Corporation: *See—*
Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., 4,179,979, Cl. 89-36.00A.

Gooley, Marshall J., to Daniels Manufacturing Corp. Wire stripping tool. 4,179,956, Cl. 81-9.50R.

Gorcey, Raymond A. Slide mounting work station. 4,179,984, Cl. 98-115.0LH.

Gordon, Thomas C., to Ford Motor Company. Connector plug for vehicle electrical tester. 4,180,302, Cl. 339-143.00T.

Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., to Institut Vysokikh Temperatur Akademii Nauk SSSR. Magnetohydrodynamic device. 4,180,752, Cl. 310-11.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Hydraulic fan drive system. 4,179,888, Cl. 60-420.000.

Gottlieb, Clifford C., to Sport-Fun, Inc. Skateboard. 4,180,278, Cl. 280-87.04A.

Goudie, Alexander C., to Beecham Group Limited. Pharmacologically active enol esters. 4,180,585, Cl. 424-311.000.

Grabow, Kurt: *See—*
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.

Graf, Manfred P., to Societe d'Assistance Technique pour Produits Nestle S.A. Cereal-based product and process for its production. 4,180,594, Cl. 426-560.000.

Graff, Robert A.: *See—*
Perry, Marney D., Jr.; and Graff, Robert A., 4,180,391, Cl. 55-324.000.

Graham, Douglas L.; and Graham, Mark L. Building structure and method of construction. 4,179,858, Cl. 52-262.000.

Graham, Kenneth A., to Chrysler Corporation. Flowmeter rotor mounting. 4,179,925, Cl. 73-229.000.

Graham, Mark L.: *See—*
Graham, Douglas L.; and Graham, Mark L., 4,179,858, Cl. 52-262.000.

Graham, Robert H.; and McBride, Jerald R., to R. A. Pearson Company. Case packer. 4,179,866, Cl. 53-468.000.

Graham, Tommy E.; and MacLean, Donald L., to Monsanto Company. Processes. 4,180,388, Cl. 55-16.000.

Graham, Tommy E.; and MacLean, Donald L., to Monsanto Company. Process for hydrogen recovery from ammonia purge gases. 4,180,552, Cl. 423-359.000.

Grain, Claude: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Granatek, Alphonse P.: *See—*
Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., 4,180,658, Cl. 544-27.000.

Graphic Controls Corporation: *See—*
Lawton, William R., 4,180,405, Cl. 106-14.500.

Gray, Don N.: *See—*
Crawford, James E.; and Gray, Don N., 4,179,757, Cl. 3-1.000.

Green, Barry P.: *See—*
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.

Greene, Harold R. Pneumatic transmission system. 4,180,354, Cl. 406-112.000.

Greer, Bradley G., to A & E Plastik Pak Co., Inc. Window awning. 4,180,117, Cl. 160-67.000.

Gretz, Thomas J., to Scott & Fetzer Company, The. Non-metallic sheathed cable connector. 4,180,227, Cl. 248-56.000.

Griffin, Daniel J.: *See—*
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Griffith, John Q., III: *See—*
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 4,180,466, Cl. 252-48.600.

Grigg, Geoffrey W.; and Brown, Desmond J., to Commonwealth Scientific Industrial Research Organization. Purines useful for the potentiation of antibiotics. 4,180,576, Cl. 424-251.000.

Grigoleit Company, The: *See—*
Rankins, Paul; and Howie, Robert K., Jr., 4,179,771, Cl. 16-121.000.

Grioni, Libero. Cylindrical container. 4,180,163, Cl. 206-385.000.

Grisotto, Franco: *See—*
Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, 4,179,839, Cl. 43-112.000.

Gristina, Anthony G., to Howmedica, Inc. Fixation stem for prosthetic device. 4,179,758, Cl. 3-1.910.

Gronvall, Karl O. R., to Forenade Fabriksverken. Power control device for hot gas engines. 4,179,891, Cl. 60-521.000.

Groth, Hugh F.: *See—*
Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, 4,180,366, Cl. 414-540.000.

Grover, Ross D., to Ram Industries, Inc. Stump eradicator. 4,180,107, Cl. 144-2.00N.

Grubman, Viktor G.: *See—*
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.

Grumman Corporation: *See—*
Lippert, Joseph, Jr., 4,180,372, Cl. 416-23.000.

Grundmann, Edgard: *See—*
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Buedel, Charles K., 4,180,855, Cl. 364-200.000.

GTE Sylvania Incorporated: *See—*
Ammann, Eugene O., 4,180,751, Cl. 307-428.000.
Corson, Robert M., 4,179,778, Cl. 29-25.190.
Hochella, William A., 4,180,699, Cl. 174-126.0CP.

Guckel, Henry, to Airco, Inc. Chemical-sensitive field-effect transistor. 4,180,771, Cl. 324-71.0SN.

Guidetti, Giampiero: *See—*
Caporiccio, Gerardo; Bargigia, Gianangelo; and Guidetti, Giampiero, 4,180,639, Cl. 526-243.000.

Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, to Telecommunications Radioelectriques et Telephoniques TRT. Arrangement for the automatic resynchronization of a data transmission receiver. 4,180,705, Cl. 178-69.100.

Gulf Oil Corporation: *See—*
Pryor, Bodie C., 4,179,819, Cl. 34-12.000.

Gulf & Western Industries, Inc.: *See—*
Seipp, William H., 4,180,862, Cl. 364-900.000.

Gummeringer, Henry E. Animal trap. 4,179,837, Cl. 43-87.000.

Gunderman, Robert J.; Alcock, Keith; Skinner, Charles S.; and Riley, Michael W., to United States of America, Interior. Pressure vent for explosion-proof electrical enclosures. 4,180,177, Cl. 220-88.00A.

Gupta, Tapan K.: *See—*
Ho, Shih M.; and Gupta, Tapan K., 4,180,483, Cl. 252-518.000.

Gutridge, Jack E.; and Marsh, Ronald W., to Pullman Incorporated. Fixture for passenger railway car compartment. 4,179,996, Cl. 105-345.000.

Guy, Richard. Apparatus for stretching canvas and like materials. 4,180,246, Cl. 254-77.000.

Guyot, Pierre; Coty, Alain; and Delfau, Paul, to Societe Commerciale Chauvin Arnoux Societe Anonyme Francaise. Control device for controlling the movements of two carriages of a duplex recorder. 4,180,823, Cl. 346-139.00B.

H. B. Fuller Company: *See—*
Batdorf, Vernon H., 4,180,166, Cl. 206-568.000.

Haase, Jaroslav: *See—*
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.

Habermann, Helmut, to Societe Europeenne de Propulsion. Axial electromagnetic bearing for a shaft rotating at high speed. 4,180,296, Cl. 308-10.000.

Haberthur, Berno: *See—*
Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, 4,180,434, Cl. 162-138.000.

Hackett, David E.: *See—*
Keske, Frank E.; and Hackett, David E., 4,179,952, Cl. 74-710.000.

Haga, Kenji: *See—*
Nishiyama, Takahiko; and Haga, Kenji, 4,179,883, Cl. 60-293.000.

Hagedoorn, Rijnder; and Koenderink, Ernest J. E., to De Staat der Nederlanden, te dezen vertegenwoordigd door de directeur-generaal der Posterijen, Telegrafie en Telefonie. Device for protecting electric systems, particularly telecommunication systems, against overvoltage pulses. 4,180,843, Cl. 361-119.000.

Hagiwara, Yoshiaki, to Sony Corporation. Method of making a charge transfer device. 4,179,793, Cl. 29-578.000.

Haikawa, Shozo: *See—*
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,179,955, Cl. 81-57.110.

Haines, Robert C., to Dunlop Limited. Tennis racquets. 4,180,263, Cl. 273-73.00G.

Halasa, Adel F.: *See*—
Hergenrother, William J.; and Halasa, Adel F., 4,180,647, Cl. 528-168.000.
Halicki, Frank E., to Sherwin-Williams Company, The. Apparatus for spraying a coating on the inside surfaces of longitudinal seams on can bodies. 4,180,011, Cl. 118-685.000.
Hama Hamaphot K.G. Hanke & Thomas: *See*—
Hanke, Rudolf, 4,179,960, Cl. 83-175.000.
Hamada, Osamu, to Sony Corporation. Tone generator for electrical music instrument. 4,179,969, Cl. 84-1.010.
Hamano, Sachiyuki; and Nakamura, Takaharu, to Eisai Co., Ltd. Furo[2, 3d]pyrimidine derivatives and anti-ulcer containing the same. 4,180,577, Cl. 424-251.000.
Hamilton, Albert A.: *See*—
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., 4,180,757, Cl. 313-315.000.
Einbinder, Itamar B.; and Hamilton, Albert A., 4,179,798, Cl. 29-622.000.
Hampl, Edward F., Jr., to Minnesota Mining and Manufacturing Company. Hot-junction electrode members for copper/silver chalcogenides. 4,180,415, Cl. 136-205.000.
Hampshire, William J.: *See*—
Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., 4,179,979, Cl. 89-36.00A.
Hanada, Mitsugu; and Fukui, Seiji, to Shimano Industrial Company, Limited. Gear transmission control device for multiple-speed hub for bicycles. 4,179,953, Cl. 74-750.00B.
Hanahara, Tohru: *See*—
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, 4,180,811, Cl. 340-566.000.
Hance, Charles M.; and Martin, Charles D., to M. Lowenstein & Sons, Inc. Fabrics having flocked corduroy ribs. 4,180,606, Cl. 428-88.000.
Hanke, Rudolf, to Hama Hamaphot K.G. Hanke & Thomas. Film splicer. 4,179,960, Cl. 83-175.000.
Hanley, John P.; Petrucci, Pasquale M.; and Pfeifer, Stanley, to Becton, Dickinson and Company. Purging means for aperture of blood cell counter. 4,180,091, Cl. 137-238.000.
Hansen, Bertil; and Holmberg, Krister, to Aktiebolaget Leo. Method for the preparation of esters. 4,180,504, Cl. 260-239.55D.
Hansen, Hans J., to Hoffmann-La Roche Inc. Carcinoembryonic antigens. 4,180,499, Cl. 260-112.00R.
Hansen, Peter: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; and Hansen, Peter, 4,180,068, Cl. 128-214.00R.
Hansen, Peter R.; and Thorsen, Niels P., to Danfoss A/S. Pressure-dependent electric switching device. 4,180,714, Cl. 200-81.00R.
Hanson, Goodwin. Epitrochoidal Stirling type engine. 4,179,890, Cl. 60-519.000.
Hanson, Lester. Apparatus and system for processing oil shale. 4,180,718, Cl. 219-10.55A.
Hara, Tsutomu: *See*—
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000.
Harada, Isamu: *See*—
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.
Harada, Yuji: *See*—
Hirata, Osamu; and Harada, Yuji, 4,180,711, Cl. 200-5.00A.
Harben, Grover S., Jr. Drum/disk poultry picker. 4,179,772, Cl. 17-47.000.
Hardigg, James S. Truss panel mold. 4,180,232, Cl. 249-60.000.
Harnish, Eugene E.: *See*—
Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., 4,180,147, Cl. 188-71.800.
Harre, Kurt J. S.; and Tufvesson, Kent A., to ABU Aktiebolag. Fishing reels for retaining the line during casting. 4,180,217, Cl. 242-84.20A.
Harrington Manufacturing Company: *See*—
Danford, Tiras J., 4,179,857, Cl. 52-71.000.
Harris Corporation: *See*—
Bouverie, William M.; and Manas, Spero G., 4,179,922, Cl. 73-116.000.
Himmel, Ronald G., 4,180,255, Cl. 270-54.000.
Mason, Donald R., 4,180,825, Cl. 357-16.000.
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
White, Charles M., 4,180,765, Cl. 315-408.000.
Harris, Donald E. Self propelled kite. 4,180,221, Cl. 244-13.000.
Harris, Gerald R. Vertical band saw and feed table. 4,179,961, Cl. 83-206.000.
Harris, Jeffrey J.; and Rampling, Brian W., to English Electric Valve Company Limited. Thermal camera tubes. 4,180,759, Cl. 313-388.000.
Harrop, Geoffrey A. J., to Atari, Inc. Ball rollover switch assembly. 4,180,267, Cl. 273-127.00R.
Harsch, Klaus: *See*—
Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, 4,180,026, Cl. 123-32.0EF.
Hartmann & Braun Aktiengesellschaft: *See*—
Fabinski, Walter; and Deptolla, Udo, 4,180,732, Cl. 250-344.000.
Hartmann, Hans-Joerg: *See*—
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.
Hartmann, Klaus: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,180,702, Cl. 250-227.000.
Harvey, Albert J., to Diamond International Corporation. Article inflating system. 4,180,105, Cl. 141-165.000.
Harvey, Joseph C., to Woodstream Corporation. Trigger for trap. 4,179,838, Cl. 43-92.000.
Haseltine, Marcus W., Jr.: *See*—
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 4,180,466, Cl. 252-48.600.
Hashem, Mohammed M.: *See*—
Chakrabarti, Paritosh M.; and Hashem, Mohammed M., 4,180,532, Cl. 260-953.000.
Hashimoto, Yoshinobu: *See*—
Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, 4,180,672, Cl. 560-15.000.
Hasker, Jan; and Peters, Cornelis, to U.S. Philips Corporation. Method of producing a low-pressure gas discharge lamp. 4,179,777, Cl. 29-25.130.
Hatakeyama, Junichi: *See*—
Miyaoka, Shinichiro; Matsumoto, Kuniaki; and Hatakeyama, Junichi, 4,180,083, Cl. 137-101.250.
Haubner, Georg: *See*—
Wesemeyer, Jurgen; and Haubner, Georg, 4,180,803, Cl. 340-164.00R.
Haviv, Fortuna; Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. 7-[(Substituted-isothioureamethyl)phenyl]-acetamidocephalosporin derivatives. 4,180,661 Cl. 544-29.000.
Hayami, Heijiro: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, to Warner-Lambert Company. 15-Cycloalkyl-prostaglandin derivatives. 4,180,675, Cl. 560-118.000.
Hayes, Robert R., to Oatey Co. Hand plane. 4,179,779, Cl. 29-78.000.
Hays, James R., Sr.: *See*—
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,180,548, Cl. 423-223.000.
Hegar, Gert: *See*—
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
Heikel, Henrik R., to Dow Chemical Company, The. Bonded asbestos diaphragms and mats. 4,180,449, Cl. 204-296.000.
Heikkinen, Urho, to Kone Osakeyhtio. Apparatus for timber barking. 4,180,109, Cl. 144-208.00D.
Heineken Technisch Beheer B.V.: *See*—
van Strien, Johannes, 4,179,918, Cl. 73-19.000.
Heitland, Herbert: *See*—
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.
Heitz, Pierre, to Compagnie d'Etudes et de Realisations de Cybernetique. Seal for sealing between two telescopic tubes and sealing device using such seal. 4,180,272, Cl. 277-28.000.
Helbert, J. Raymond: *See*—
Chicoye, Etzer; Helbert, J. Raymond; and Rice, James F., 4,180,589, Cl. 426-11.000.
Heller, Jorge; and Baker, Richard W., to Alza Corporation. System for delivering agent to environment of use over prolonged time. 4,180,064, Cl. 128-130.000.
Heller, Jorge: *See*—
Choi, Nam S.; and Heller, Jorge, 4,180,646, Cl. 528-153.000.
Helwig, William F., Jr., to Avtec Industries, Inc. Energy management system. 4,180,744, Cl. 307-39.000.
Henderson, Delbert H. Furnace fireplace apparatus having separate combustion and heating air systems and settling chambers for particulate matter. 4,180,052, Cl. 126-108.000.
Henkel Corporation: *See*—
Floyd, Don E., 4,180,487, Cl. 260-18.00N.
Henneberger, Heinz: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,180,702, Cl. 250-227.000.
Hennig, Franz, to Jagenberg-Werke Aktiengesellschaft. Apparatus for removing the forward margin of a sheet. 4,180,193, Cl. 225-101.000.
Henning, James. Front mounted ground supported tractor attachment. 4,180,282, Cl. 280-481.000.
Henrich, Donald A.; and Rose, Edgar, to Outboard Marine Corporation. Marine propeller fish line and weed cutter. 4,180,368, Cl. 416-146.00R.
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., to Motorola, Inc. Carrier structure integral with an electronic package and method of construction. 4,180,161, Cl. 206-328.000.
Herb, John R., to Pharmachem Corporation. Iron preparations and methods of making and administering the same. 4,180,567, Cl. 424-180.000.
Herbertz, Toni: *See*—
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, 4,180,617, Cl. 428-398.000.
Herbst, LeRoy J.; and Jenkins, Thomas E., to General Electric Company. Dishwasher vent arrangement. 4,179,821, Cl. 34-235.000.
Hergenrother, William J.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene copolymers containing malononitrile and substituted malononitrile substituents. 4,180,647, Cl. 528-168.000.

Hermann nee Szente, Ilona: *See*—
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,180,641, Cl. 528-27.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,180,653, Cl. 528-391.000.
Hermanson, Michael P.: *See*—
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., 4,180,133, Cl. 172-26.000.
Hernandez, Fredrico. Internal combustion engine fan adapter. 4,180,024, Cl. 123-41.460.
Herpich, William A.; and Palmer, George W., to Peabody International Corporation. Hydraulic system for a refuse truck. 4,180,365, Cl. 414-525.000.
Hertfelder, Wilhelm, to Robert Bosch GmbH. Pneumatically operated valve with a manually operated back-up displacing mechanism. 4,180,234, Cl. 251-14.000.
Herzog, Donald G.: *See*—
Hudson, Kenneth C.; and Herzog, Donald G., 4,180,822, Cl. 346-108.000.
Hester, Jackson B., Jr., to Upjohn Company, The. Piperidino-4H-s-triazolo[4,3-a][1,4]benzodiazepines. 4,180,668, Cl. 260-244.400.
Hewlett-Packard Company: *See*—
Murphy, John B., 4,180,080, Cl. 128-642.000.
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.
Heydrich, Hans, to Cummins Engine Company, Inc. Internal combustion engine with exhaust gas recirculation. 4,179,892, Cl. 60-605.000.
Hickam, William M.: *See*—
Phillips, David C.; Hickam, William M.; and Smith, James D. B., 4,179,926, Cl. 73-339.00R.
Hiersteiner, Walter L., to Tension Envelope Corporation. Two-way envelope. 4,180,168, Cl. 206-626.000.
Hilberg, Ronald P.: *See*—
Hook, William R.; and Hilberg, Ronald P., 4,180,779, Cl. 329-50.000.
Hildebrand, James R., to United States of America, Air Force. Single blade proximity probe. 4,180,329, Cl. 356-375.000.
Hildebrecht, Harold V., to Towmotor Corporation. Control pedal. 4,179,949, Cl. 74-474.000.
Hildering, Willem C.: *See*—
Schermer, Gijsbertus J. H.; Winters, Hubertus H. A.; Hildering, Willem C.; and Nickl von Nikelsberg, Karl F., 4,180,828, Cl. 357-79.000.
Hill, Orvin G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in her Britannic Majesty's Government of the. Radio identification systems. 4,180,815, Cl. 343-6.50R.
Himmel, Ronald G., to Harris Corporation. Wiper system inserter. 4,180,255, Cl. 270-54.000.
Hines, James: *See*—
Zurit, David; Cerrato, Vincent; and Hines, James, 4,180,189, Cl. 222-400.700.
Hinz, Rolf. Frontal mouth plate for orthodontic prophylaxis and early treatment of dental anomalies. 4,179,811, Cl. 433-6.000.
Hirai, Jun: *See*—
Nishikawa, Masaru; Numakura, Toshihiko; and Hirai, Jun, 4,180,833, Cl. 360-21.000.
Hirai, Seiichi: *See*—
Otsuka, Nobuyuki; Hirai, Seiichi; and Sogabe, Motoshige, 4,180,344, Cl. 403-57.000.
Hirano, Noboru: *See*—
Imaizumi, Masao; Yasuda, Mitsuo; Sakata, Ko; and Hirano, Noboru, 4,180,688, Cl. 568-899.000.
Hirata, Osamu; and Harada, Yuji, to Canon Kabushiki Kaisha. Desk-top calculator keyboard switch. 4,180,711, Cl. 200-5.00A.
Hirota, Kiwami; Tamano, Hideki; and Inazawa, Shintaro, to Showa Denko Kabushiki Kaisha. Process for polymerizing or co-polymerizing propylene. 4,180,636, Cl. 526-125.000.
Hisaka Works, Ltd.: *See*—
Sumitomo, Hiroyuki, 4,180,129, Cl. 165-110.000.
Hisamatsu, Takashi: *See*—
Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, 4,180,655, Cl. 536-17.00R.
Hitachi, Ltd.: *See*—
Inoyama, Tadao; Matsumura, Yasuhide; and Nagano, Yukio, 4,179,783, Cl. 29-281.500.
Maeda, Yoshio; Matsumoto, Koichi; and Kamitake, Seigo, 4,180,327, Cl. 356-320.000.
Miyaoka, Shinichiro; Matsumoto, Kuniaki; and Hatakeyama, Junichi, 4,180,083, Cl. 137-101.250.
Shimokawa, Ryushi, 4,180,797, Cl. 340-146.200.
Takagi, Nobuho; Maegawa, Muneo; and Nii, Katsutoshi, 4,180,273, Cl. 277-154.000.
Yamada, Takahiro, 4,180,225, Cl. 346-75.000.
Yoneda, Yutaka, 4,180,813, Cl. 340-784.000.
Yoshihara, Touhachi; Nishiwaki, Koji; and Seki, Kiwao, 4,180,857, Cl. 364-497.000.
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Tone wave generator in electronic musical instrument. 4,179,972, Cl. 84-1.110.
Ho, Shih M.; and Gupta, Tapan K., to Electric Power Research Institute, Inc. Method for forming zinc oxide-containing ceramics by hot pressing and annealing. 4,180,483, Cl. 252-518.000.
Ho, Yin F., to Madison Ltd. Controller with individually or simultaneously movable arms. 4,179,843, Cl. 46-126.000.
Hobart Brothers Company: *See*—
Barhorst, Ralph E., 4,180,720, Cl. 219-130.510.
Hobo, Nobuhito; Suzuki, Yutaka; Naito, Takashi; and Konishi, Yoshimune, to Nippondenso Co., Ltd. Injection pump control system. 4,180,037, Cl. 123-139.00E.
Hoch, Norman J. Broken tool detector. 4,180,356, Cl. 408-8.000.
Hochella, William A., to GTE Sylvania Incorporated. Shielded electrically conductor. 4,180,699, Cl. 174-126.0CP.
Hochiki Corporation: *See*—
Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, 4,180,804, Cl. 340-310.00R.
Hoechst Aktiengesellschaft: *See*—
Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, 4,180,575, Cl. 424-250.000.
Schrodter, Klaus; Kandler, Joachim; and Spott, Hasso, 4,180,471, Cl. 252-140.000.
Schroter, Herbert, 4,180,317, Cl. 354-318.000.
Hoenig, James R.; and Mallorca, Salvador C., to Continental Group, Inc., The. Beaded snaplock closure. 4,180,179, Cl. 220-307.000.
Hofbauer, Peter: *See*—
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, to Robert Bosch GmbH. Regulator for a fuel injection pump. 4,180,040, Cl. 123-140.00R.
Hoffman, Carl S., to TP Laboratories, Inc. Dental device. 4,179,815, Cl. 433-140.000.
Hoffmann, Kurt, to Siemens Aktiengesellschaft. Arrangement, in particular an analog-digital converter and method of operation thereof. 4,180,806, Cl. 340-347.0AD.
Hoffmann-La Roche Inc.: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,180,682, Cl. 568-662.000.
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.
Goldberg, Arthur H.; and Franklin, Michael L., 4,180,558, Cl. 424-16.000.
Hansen, Hans J., 4,180,499, Cl. 260-112.00R.
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,180,662, Cl. 544-48.000.
Hofmann, George H., to Du Pont de Nemours, E. I., and Company. Acrylic multistage graft copolymer products and processes. 4,180,529, Cl. 525-85.000.
Hogan, Gerard T.: *See*—
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., 4,180,125, Cl. 165-48.000.
Hohmann, Gerhard: *See*—
Dollhausen, Manfred; Hohmann, Gerhard; and Behr, Winfried, 4,180,638, Cl. 526-204.000.
Hokari, Saburo: *See*—
Nozawa, Shiyozo; Hokari, Saburo; and Yamaga, Shigeru, 4,180,315, Cl. 354-170.000.
Hokushin Gohan Kabushiki Kaisha: *See*—
Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, 4,180,185, Cl. 222-57.000.
Holcomb, Orla L., Jr.: *See*—
Johannesen, Donald D.; and Holcomb, Orla L., Jr., 4,180,149, Cl. 188-340.000.
Hollis Engineering, Inc.: *See*—
O'Rourke, Harold T.; and Abbott, Warren G., 4,180,199, Cl. 228-102.000.
Hollis, Ernest E., to Sanders Associates, Inc. Method of making a miniature fiber optic connector. 4,179,801, Cl. 29-626.000.
Holmberg, Krister: *See*—
Hansen, Bertil; and Holmberg, Krister, 4,180,504, Cl. 260-239.55D.
Holmes, Jon E.: *See*—
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Otsuka, Nobuyuki; Hirai, Seiichi; and Sogabe, Motoshige, 4,180,344, Cl. 403-57.000.
Hook, William R.; and Hilberg, Ronald P., to United States of America, Air Force. QPSK Demodulator with two-step quadrupler and/or time-multiplexing quadrupling. 4,180,779, Cl. 329-50.000.
Hopping, Alvin S., deceased; and by Johnson, Clifford A., executor, to Fell, Markley D. Turbine-wheeled power device. 4,179,885, Cl. 60-370.000.
Horn, Ulrich: *See*—
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.
Horst, Thomas A.; and Welton, Charles L., to Horst, Thomas A., a part interest. Stirrup buckle sheath. 4,179,869, Cl. 54-46.000.
Hosaka, Masao: *See*—
Watanabe, Tsutomu; Yanagawa, Nobuyuki; and Hosaka, Masao, 4,180,721, Cl. 219-216.000.
Houlihan, William J., to Sandoz, Inc. Dibenz[c,f]imidazo [1,2-a] [1]azepin-9-ols. 4,180,671, Cl. 548-324.000.
Housing Systems, Inc.: *See*—
Johnson, James H., 4,180,233, Cl. 249-144.000.

Howell, Carl J., Jr.; Trott, David W.; and Riley, Jesse L., to Celanese Corporation. Process for extruding plasticized open cell foamed cellulose acetate filters. 4,180,536, Cl. 264-53.000.

Howell, John K., Jr., to Oxy Metal Industries Corporation. Coating bath composition and method. 4,180,603, Cl. 427-353.000.

Howie, Robert K., Jr.: *See—*
Rankins, Paul; and Howie, Robert K., Jr., 4,179,771, Cl. 16-121.000.

Howmedica, Inc.: *See—*
Gristina, Anthony G., 4,179,758, Cl. 3-1.910.

Howmet Turbine Components Corporation: *See—*
Burd, Lamar; and Donnelly, James K., 4,180,119, Cl. 164-34.000.

Hromatka, Otto: *See—*
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,180,662, Cl. 544-48.000.

Hsieh, Edmund J., to United States of America, Energy. Magnetic thin-film split-domain current sensor-recorder. 4,180,775, Cl. 324-249.000.

Hsu, William W.; and McPherson, Robert, to Textron Inc. Automatic and manual linear reversion control mechanism. 4,180,243, Cl. 251-234.000.

Huber, Harold E., to Richardson-Merrell Inc. Coated 1-(2-chlorodibenzo[b,f]oxepin-10-yl)-4-methylpiperazine compositions. 4,180,559, Cl. 424-35.000.

Hubner-Vamag Aktiengesellschaft & Co. Kommanditgesellschaft: *See—*
Rosenitsch, Johann, 4,180,244, Cl. 251-309.000.

Hudnall, Walter E. Solar-heat collector. 4,180,055, Cl. 126-446.000.

Hudson, Kenneth C.; and Herzog, Donald G., to RCA Corporation. Optical scanner and recorder. 4,180,822, Cl. 346-108.000.

Hueil, J. Charles; Rothfuss, Robert G.; and Boothby, Terry A., to Senco Products, Inc. Anvil attachment for a surgical stapling instrument. 4,180,196, Cl. 227-109.000.

Huempfner, David F., to American Hospital Supply Corporation. Tiltable table. 4,180,002, Cl. 108-6.000.

Hughes Aircraft Company: *See—*
Bilow, Norman; and Austin, William B., 4,180,649, Cl. 528-245.000.
Forward, Robert L.; and Thurmond, Gary D., 4,180,786, Cl. 333-32.000.

Hughes, Hugh M., to Wylain, Inc. Dual source heat pump. 4,179,894, Cl. 62-2.000.

Hughes, William B.: *See—*
Reusser, Robert E.; and Hughes, William B., 4,180,524, Cl. 585-644.000.

Humber, Leslie G.: *See—*
Demerson, Christopher A.; and Humber, Leslie G., 4,180,580, Cl. 424-258.000.

Humphrey Instruments, Inc.: *See—*
Humphrey, William E., 4,180,325, Cl. 356-127.000.

Humphrey, William E., to Humphrey Instruments, Inc. Lens meter with automated readout. 4,180,325, Cl. 356-127.000.

Hungerbuhler, Walter: *See—*
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.

Hunsucker, Jerry H., to International Minerals & Chemical Corp. Durable press finishing with oxazolidine catalysts. 4,180,382, Cl. 8-185.000.

Hunter Douglas International N.V.: *See—*
Vecchiarelli, Francis, 4,180,118, Cl. 160-178.00C.

Hunter, Richard E.; and Shook, Robert C., to Irrigation & Power Equipment, Inc. Center pivot construction for center pivot sprinkler. 4,180,092, Cl. 137-344.000.

Hunter, Robert F. Small animal trap. 4,179,835, Cl. 43-61.000.

Huret, Roger H. M., to Etablissements Huret & Ses Fils. Speedometer for mounting on a cycle. 4,179,935, Cl. 73-493.000.

Hurst Performance, Inc.: *See—*
Airheart, Franklin B., 4,180,146, Cl. 188-71.800.

Hussmann, Eckart: *See—*
Schnabel, Roland; and Hussmann, Eckart, 4,180,056, Cl. 126-447.000.

Hutter, Harold G., to Bunker Ramo Corporation. Coaxial cable connector. 4,180,301, Cl. 339-90.00C.

Huydts, Eduard J. C., to G. Siempelkamp GmbH & Co. Apparatus for the external calibration (sizing) of tubular elements. 4,179,915, Cl. 72-402.000.

Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., to Air Products & Chemicals, Inc. Isentropic expansion of gases via a pelton wheel. 4,179,897, Cl. 62-9.000.

Hybl, James M.: *See—*
Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., 4,180,712, Cl. 200-16.00D.

Iguchi, Sadahiko: *See—*
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.

Ikeda, Richard M.: *See—*
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.

Ilenda, Casmir S., to Rohm and Haas Company. Polyaminoesters and foams made therefrom. 4,180,632, Cl. 521-184.000.

Illingworth, George E., to UOP Inc. Alkylation of aromatic hydrocarbons for detergent precursors. 4,180,691, Cl. 585-455.000.

Illinois Tool Works Inc.: *See—*
Sygnator, Henry A., 4,179,976, Cl. 85-47.000.

Imai, Tamotsu, to UOP Inc. Oxydehydrogenation of alkylaromatic hydrocarbons and catalytic composite therefor. 4,180,690, Cl. 585-443.000.

Imaizumi, Masao; Yasuda, Mitsuo; Sakata, Ko; and Hirano, Noboru, to Nippon Oil Co., Ltd. Method for continuously producing tert-butyl alcohol. 4,180,688, Cl. 568-899.000.

Imperial Chemical Industries Limited: *See—*
Andrew, Malcolm S.; and Backhouse, Alan J., 4,180,489, Cl. 428-402.000.
Ward, Stanley A., 4,180,543, Cl. 422-148.000.

Inauen Maschinen AG: *See—*
Landolt, Bruno, 4,179,862, Cl. 53-86.000.

Inazawa, Shintaro: *See—*
Hirota, Kiwami; Tamano, Hideki; and Inazawa, Shintaro, 4,180,636, Cl. 526-125.000.

Indian Explosives Limited: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,180,425, Cl. 149-95.000.

Industrial Filter & Pump Mfg. Co.: *See—*
Zievers, James F., 4,180,459, Cl. 210-10.000.

Industrial Service & Manufacturing Co.: *See—*
Stevick, Ronald A., 4,180,155, Cl. 198-498.000.

Industrie Automation GmbH & Co.: *See—*
Duhrkoop, Jens; and Pusch, Gunter, 4,180,306, Cl. 350-6.400.

Ingersoll-Rand Company: *See—*
Webb, Paul D., 4,180,089, Cl. 137-115.000.

Inokuchi, Toshiyuki: *See—*
Matsumoto, Fuyuhiko; and Inokuchi, Toshiyuki, 4,180,318, Cl. 355-11.000.

Inoyama, Tadao; Matsumura, Yasuhide; and Nagano, Yukio, to Hitachi, Ltd. Holding apparatus with elastic mechanism. 4,179,783, Cl. 29-281.500.

Inskip, Harold K., to Du Pont de Nemours, E. I., and Company. Plasticized polyvinyl butyral sheeting with a divalent metal salt of neo decanoic acid adhesion control agent. 4,180,620, Cl. 428-524.000.

Institut Francais du Petrole: *See—*
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 4,180,550, Cl. 423-242.000.
Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, 4,180,453, Cl. 208-57.000.
Marcilly, Christian, 4,180,693, Cl. 585-475.000.

Institut Pasteur: *See—*
Fauve, Robert, 4,180,563, Cl. 424-92.000.

Institut Vysokikh Temperatur Akademii Nauk SSSR: *See—*
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.

Intel Corporation: *See—*
Shappir, Joseph, 4,180,826, Cl. 357-41.000.

Intermodal Concepts, Inc.: *See—*
Kirwan, George B., 4,179,997, Cl. 410-53.000.

International Business Machines Corporation: *See—*
Brock, Geoffrey E., 4,180,416, Cl. 148-1.500.
Cialone, David R.; and West, Donald L., 4,180,703, Cl. 250-237.00G.
Clark, Harold A., 4,180,432, Cl. 156-643.000.
Crowder, Billy L.; and Zirinsky, Stanley, 4,180,596, Cl. 427-42.000.
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., 4,180,439, Cl. 204-1.00T.
Feng, Bai-Cwo; and Feng, George C., 4,180,604, Cl. 430-270.000.
Gates, Harlan R., 4,180,827, Cl. 357-44.000.
Joshi, Kailash C.; and Spaight, Ronald N., 4,179,802, Cl. 29-628.000.
Joshi, Kailash C., 4,180,863, Cl. 365-2.000.
Pettit, John W., 4,180,704, Cl. 250-237.00G.

International Harvester Company: *See—*
Beck, Harold D.; and Kolthoff, C. Paul, Jr., 4,180,130, Cl. 165-124.000.
Birkenbach, Eugen J.; and Woodworth, Robert D., 4,180,135, Cl. 172-407.000.

International Minerals & Chemical Corp.: *See—*
Hunsucker, Jerry H., 4,180,382, Cl. 8-185.000.

International Paper Company: *See—*
Fries, Carl, Jr., 4,180,180, Cl. 221-1.000.

International Standard Electric Corporation: *See—*
Barton, Paul, 4,180,814, Cl. 343-5.0DP.

International Tel Data Corporation: *See—*
Cosgrove, John D.; Pettis, Charles D.; and Mullett, Charles E., 4,180,709, Cl. 179-2.0AM.

Interstate Electronics Corp.: *See—*
Weber, Larry F., 4,180,762, Cl. 315-169.400.

Interx Research Corporation: *See—*
Eriksen, Stuart P., 4,180,586, Cl. 424-311.000.

Intraco, Inc: *See—*
Jones, Robert D., 4,180,136, Cl. 177-68.000.

Inuiya, Masafumi, to Fuji Photo Film Co., Ltd. Stereoscopic camera. 4,180,313, Cl. 354-112.000.

Ionics Inc.: *See—*
McRae, Wayne A., 4,180,451, Cl. 204-301.000.

Iowa State University Research Foundation, Inc.: *See—*
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., 4,180,133, Cl. 172-26.000.

Irani, Mazin R.: *See—*
Sherif, Fawzy G.; and Irani, Mazin R., 4,180,630, Cl. 521-106.000.

Irrigation & Power Equipment, Inc.: *See—*
Hunter, Richard E.; and Shook, Robert C., 4,180,092, Cl. 137-344.000.

Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, to Cnisso Corporation; and Sanyo Kokusaku Pulp Co Ltd. Method for producing organic fertilizers. 4,180,392, Cl. 71-25.000.

Ishii, Fumikatsu: *See—*
Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, 4,180,185, Cl. 222-57.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000.
Saotome, Shigeo, 4,179,982, Cl. 92-5.00R.
Ujiie, Nobuhisa, 4,180,250, Cl. 266-137.000.

Isoyama, Kenji: *See—*
Shibata, Toshiyuki; Ono, Hiroshi; and Isoyama, Kenji, 4,180,546, Cl. 423-178.000.

Isozaki, Hiroshi: *See—*
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000.

Isshiki, Isao; Ohoka, Akihiro; and Sato, Koji, to Sumitomo Electric Industries, Ltd. Character reading system. 4,180,800, Cl. 340-146.3SY.

Itabashi, Ryuzo: *See—*
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.

Itakura Soki Co., Ltd.: *See—*
Itakura, Tsuyoshi, 4,180,377, Cl. 417-413.000.

Itakura, Tsuyoshi, to Itakura Soki Co., Ltd. Valve element for an air pump. 4,180,377, Cl. 417-413.000.

Itatani, Hiroshi: *See—*
Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,180,607, Cl. 528-112.000.

Ito, Hideo: *See—*
Ozawa, Akio; Sakamoto, Masaharu; and Ito, Hideo, 4,180,750, Cl. 307-362.000.

Ivanko, Theodore, to Avco Corporation. Composite metal-ceramic turbine nozzle. 4,180,371, Cl. 415-115.000.

Ivers, Michael S.; and Ivers, Rory B. Support for a motorcycle. 4,180,253, Cl. 269-296.000.

Ivers, Rory B.: *See—*
Ivers, Michael S.; and Ivers, Rory B., 4,180,253, Cl. 269-296.000.

Iwaki, Hiroshi; and Nakamura, Masaaki, to Sanyo Electric Co., Ltd. Electric fan. 4,180,376, Cl. 417-360.000.

Iwao, Noriaki, to Tomy Kogyo Co., Inc. Apparatus for teaching numerical concepts. 4,179,825, Cl. 35-32.000.

Iwata, Minoru: *See—*
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.

Iyengar, Jagannathan N.: *See—*
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,180,548, Cl. 423-223.000.

J. C. Penney Corporation, Inc., The: *See—*
Koenig, Richard W.; Girard, Philip R.; and Neuhauser, Alfred J., 4,180,204, Cl. 235-385.000.

J. H. Industries, Inc.: *See—*
Johnson, Dwight N., 4,180,096, Cl. 137-403.000.

J. I. Case Company: *See—*
Tucek, Frank J., 4,180,274, Cl. 277-192.000.

Jackson, Douglas: *See—*
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,180,171, Cl. 212-61.000.

Jacob, Bart M. Tube type diaphragm game call. 4,179,845, Cl. 46-178.000.

Jacobs, David R., to Spanel, Abram N. Creel. 4,180,218, Cl. 242-131.000.

Jacobsen, Alan N. Method and apparatus for the spinning of yarn. 4,179,874, Cl. 57-58.890.

Jacobsen, Stephen C.; Stephen, Robert L.; and Hansen, Peter, to Motion Control, Incorporated. Bi-directional flow catheter with retractable trocar/valve structure. 4,180,068, Cl. 128-214.00R.

Jaffe, Wolfgang: *See—*
Peterson, Wesley R.; and Jaffe, Wolfgang, 4,180,007, Cl. 112-278.000.

Jagenberg-Werke Aktiengesellschaft: *See—*
Hennig, Franz, 4,180,193, Cl. 225-101.000.

Jagtap, Ashvinkumar N.: *See—*
Bienvenu, Joseph O.; and Jagtap, Ashvinkumar N., 4,180,408, Cl. 106-31.000.

James, Robert G. Counterbalanced pumping system. 4,179,947, Cl. 74-89.200.

Jameson, Melvin N.; and Krulik, Gerald A., to McGean Chemical Company, Inc. Catalytically active compositions from precious metal complexes. 4,180,480, Cl. 252-429.00R.

Jaquay, Louis H., to Dravo Corporation. Apparatus for recovering lead from battery mud. 4,180,251, Cl. 266-172.000.

Jay, Gary: *See—*
Sandefur, Herbert G., 4,179,840, Cl. 43-131.000.

JENAer Glaswerk Schott & Gen.: *See—*
Schnabel, Roland; and Hussmann, Eckart, 4,180,056, Cl. 126-447.000.

Jenkins, Thomas E.: *See—*
Herbst, LeRoy J.; and Jenkins, Thomas E., 4,179,821, Cl. 34-235.000.

Jer Manufacturing, Inc.: *See—*
Kragt, Gerald A., 4,179,788, Cl. 29-407.000.

Jessop Enterprises Pty. Ltd.: *See—*
Ward, John, 4,180,057, Cl. 126-449.000.

Jet Research Center, Inc.: *See—*
Orrill, Larry M.; and Regalbuto, John A., 4,180,351, Cl. 405-303.000.

Jewett, Robert A.: *See—*
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Johannesen, Donald D.; and Holcomb, Orla L., Jr., to Bendix Corporation, The. Drum brake and mounting means therefor. 4,180,149, Cl. 188-340.000.

John Wyeth & Brother Limited: *See—*
Edington, Edwin T.; and White, Alan C., 4,180,670, Cl. 546-284.000.

Johns-Manville Corporation: *See—*
Smith, Harvell M., 4,179,808, Cl. 30-293.000.

Johns, McKinley R., to RCA Corporation. Circularly polarized antenna system using a combination of horizontal and bent vertical dipole radiators. 4,180,820, Cl. 343-798.000.

Johnson, Albert O., to Tire-Gator, Inc. Methods of handling waste including rubber tires. 4,180,004, Cl. 110-346.000.

Johnson, Clifford A., executor: *See—*
Hopping, Alvin S., deceased; and Johnson, Clifford A., executor, 4,179,885, Cl. 60-370.000.

Johnson, Clifton E.: *See—*
Steiger, Douglass W.; and Johnson, Clifton E., 4,180,363, Cl. 414-347.000.

Johnson, Dwight N., to J. H. Industries, Inc. Fill valve. 4,180,096, Cl. 137-403.000.

Johnson, F. Walter. Guide for portable power tool. 4,179,965, Cl. 83-745.000.

Johnson, James H., to Housing Systems, Inc. Building construction system. 4,180,233, Cl. 249-144.000.

Johnson, Lavell R., to Becton, Dickinson and Company. Chamber holder for immobilized immunoadsorbent. 4,180,383, Cl. 422-69.000.

Johnson, Matthey & Co., Limited: *See—*
Barnes, Roderick G. L., 4,180,477, Cl. 252-301.40R.

Johnson, Ronald D.: *See—*
Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., 4,180,564, Cl. 424-117.000.

Johnson, Wendell C., to Xerox Corporation. Method of making a resistor array. 4,179,797, Cl. 29-610.00R.

Johnston, Howard; and Senkbeil, Herman O., to Dow Chemical Company, The. 6-Fluoro-3,5-dihalo-2-pyridyloxy compounds. 4,180,395, Cl. 71-94.000.

Jolas, Fernand: *See—*
Stiker, Bernard; and Jolas, Fernand, 4,180,441, Cl. 204-2.100.

Jones, Robert D., to Intraco, Inc. Weight actuated feed drop apparatus. 4,180,136, Cl. 177-68.000.

Jones, Walter: *See—*
Maynard, Michael; and Jones, Walter, 4,180,621, Cl. 428-535.000.

Jordan, William E.: *See—*
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., 4,180,860, Cl. 364-900.000.

Joseph, George L.; and Brolin, Charles A., to FMC Corporation. Torsion bar and method of forming the same. 4,180,421, Cl. 148-150.000.

Joshi, Kailash C.; and Spaight, Ronald N., to International Business Machines Corporation. Studded chip attachment process. 4,179,802, Cl. 29-628.000.

Joshi, Kailash C., to International Business Machines Corporation. Magnetic domain device modular assembly. 4,180,863, Cl. 365-2.000.

Judd, Frederick V. H. Distributor for gas turbine silencers. 4,180,141, Cl. 181-264.000.

Jung, Michel: *See—*
Metcalf, Brian W.; and Jung, Michel, 4,180,509, Cl. 260-326.14T.

Jungverdorben, Hermann-Josef: *See—*
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, 4,180,617, Cl. 428-398.000.

K-G Devices Corporation: *See—*
Kirkgasser, James P.; and Goldsmith, Arthur C., 4,179,964, Cl. 83-599.000.

Kabushiki Kaisha Oichi: *See—*
Takeuchi, Toshio, 4,180,063, Cl. 128-25.00B.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,179,989, Cl. 101-291.000.

Kabushiki Kaisha Seikosha: *See—*
Moritani, Nakanobu, 4,179,853, Cl. 51-165.00R.

Kabushiki Kaisha Terauchi Seisakusho: *See—*
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,179,955, Cl. 81-57.110.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Masaki, Hideyuki, 4,180,410, Cl. 106-73.200.

Kaeppel, Hanshelmut: *See—*
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.

Kaiser, John J.: *See—*
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000.

Kaiyoh, Hirofumi: *See—*
Komori, Kazuaki; and Kaiyoh, Hirofumi, 4,180,798, Cl. 340-146.30H.

Kajima, Hisashi: *See—*
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, 4,180,399, Cl. 75-229.000.

Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, to Kaltenbach & Voight GmbH & Co. Dental treatment apparatus. 4,180,812, Cl. 340-706.000.

Kaltenbach & Voight GmbH & Co.: *See—*
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmu', 4,180,812, Cl. 340-706.000.

Kamezaki, Masaaki, to Taisei Kosan Kabushiki Kaisha. Air pressure control apparatus for a hot or cold storage chamber. 4,180,093, Cl. 137-360.000.

Kamimura, Shinobu; and Yamamoto, Hideki, to Omron Tateisi Electronics Co. Electronic sphygmomanometer. 4,180,061, Cl. 128-681.000.

Kamitake, Seigo: *See—*
Maeda, Yoshio; Matsumoto, Koichi; and Kamitake, Seigo, 4,180,327, Cl. 356-320.000.

Kanaya, Masanori: *See—*
Okumura, Haruhiko; and Kanaya, Masanori, 4,180,835, Cl. 360-118.000.

Kandler, Joachim: *See—*
Schrodter, Klaus; Kandler, Joachim; and Spott, Hasso, 4,180,471, Cl. 252-140.000.

Kane, Michael P.; and Szmuszkovicz, Jacob, to Upjohn Company, The. N-(2-Dimethylaminoalkyl)-3',4'-dichloroanilides. 4,180,522, Cl. 260-562.00R.

Kaneko, Hideaki: *See—*
Miyazaki, Yasushi; Suzuki, Masanori; and Kaneko, Hideaki, 4,180,406, Cl. 106-14.150.

Kanno, Yoshimitsu: *See—*
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.

Kanstoroom, Steven J. Variable ratio drive system including a compact variable diameter pulley. 4,179,946, Cl. 74-230.17E.

Kaplan, Leonard A., to RCA Corporation. Biasing and drive circuitry for quasi-linear transistor amplifiers. 4,180,781, Cl. 330-272.000.

Kaplan, Leonard A., to RCA Corporation. Phantom full-bridge amplifier. 4,180,782, Cl. 330-276.000.

Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., to Bristol-Myers Company. 7[-2-Alkoxyamino(acetamido)]cephalosporin derivatives. 4,180,658, Cl. 544-27.000.

Kapoor, Inder P., to American Cyanamid Company. Novel substituted dinitrotoluenes and methods for preparing the same. 4,180,679, Cl. 568-583.000.

Kasami, Akinobu: *See—*
Naito, Makoto; and Kasami, Akinobu, 4,180,423, Cl. 148-171.000.

Kashima, Mikito: *See—*
Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,180,607, Cl. 528-112.000.

Kassai Kabushiki Kaisha: *See—*
Kassai, Kenzou, 4,180,276, Cl. 280-47.360.

Kassai, Kenzou, to Kassai Kabushiki Kaisha. Back-to-face reversible push handle of a baby carriage. 4,180,276, Cl. 280-47.360.

Kastin, Abba J.: *See—*
Coy, David H.; and Kastin, Abba J., 4,180,501, Cl. 260-112.50R.

Kastner, Hans-Werner: *See—*
Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, 4,179,911, Cl. 72-78.000.

Kastner, Ralph E.: *See—*
Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., 4,180,564, Cl. 424-117.000.

Katayama, Naohiro, to Sawafuji Electric Co. Ltd. Refrigerating system. 4,179,899, Cl. 62-228.000.

Katou, Hiromitu: *See—*
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.

Katz, Diane. Portfolio. 4,180,114, Cl. 150-28.00R.

Katz, Martin; and Kent, John S., to Syntex Corporation. Inert core implant pellet. 4,180,560, Cl. 424-21.000.

Katz, Otto, to A. W. Faber-Castell. Mechanical pencil with automatic lead feed. 4,180,339, Cl. 401-67.000.

Kaufman, Robert J.: *See—*
Franz, John E.; and Kaufman, Robert J., 4,180,394, Cl. 71-86.000.

Kaufmann, Heinrich; and Moser, Kurt, to Fa. Develop KG, Dr. Eisgein & Co. Copying arrangement. 4,180,319, Cl. 355-3.00R.

Kaufmann, Otto, to BASF Aktiengesellschaft. Manufacture of concentrated solutions, having a low salt content, of cobalt and chromium 1:2 complex dyes which are free from sulfonic acid groups. 4,180,502, Cl. 260-145.00A.

Kawamura, Michio, to Nippondenso Co., Ltd. Code lock type engine control system. 4,180,043, Cl. 123-146.50B.

Kawamura, Naoto: *See—*
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.

Kawasaki, Masahiro; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometric circuit. 4,180,310, Cl. 354-24.000.

Kazuo, Yamashita; Koji, Kuroyanagi; and Naoki, Matsuo, to Shono Denpun Kabushiki Kaisha. Method of producing soy sauce. 4,180,590, Cl. 426-18.000.

Kazuo, Yamashita; Koji, Kuroyanagi; Yoshitsugu, Minamikawa; and Yasuhiro, Tanabe, to Shono Denpun Kabushiki Kaisha. Method of producing a soy sauce. 4,180,591, Cl. 426-18.000.

Keeney, Marvin F., to General Electric Company. Timer circuit for use in protective relaying applications. 4,180,842, Cl. 361-85.000.

Kegel, Hellmut: *See—*
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.

Kent, John S.: *See—*
Katz, Martin; and Kent, John S., 4,180,560, Cl. 424-21.000.

Kerb, Ulrich: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.

Keresztes, Robert J.: *See—*
Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., 4,180,147, Cl. 188-71.800.

Kerner, Ronald E. Radius and angle dresser. 4,180,046, Cl. 125-11.00A.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Klatt, Karl-Heinz; and Kussel, Eckard, 4,180,370, Cl. 415-90.000.

Keske, Frank E.; and Hackett, David E., to Caterpillar Tractor Co. Lubrication means for a torque proportioning differential. 4,179,952, Cl. 74-710.000.

Khair, Magdi K.; and McCombie, Jay C., to Chrysler Corporation. Fuel injection system and control valve for multi-cylinder engines. 4,180,022, Cl. 123-32.0AE.

Khalifa, Jacob R., to RCA Corporation. Phase lock loop data timing recovery circuit. 4,180,783, Cl. 331-2.000.

Kiefer, Gerhard: *See—*
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Kienzle, Kenneth, Jr.: *See—*
Sandefur, Herbert G., 4,179,840, Cl. 43-131.000.

Kim, Samuel S.; and Stevens, Travis E., to Rohm and Haas Company. Nonionic polyurethane thickener with surfactant cothickener and organic diluent, clear concentrates, aqueous print pastes, coloring compositions, methods of making and printing. 4,180,491, Cl. 260-29.2TN.

Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., to Abbott Laboratories. Pretreatment method for carcinoembryonic antigen assay. 4,180,556, Cl. 424-1.000.

Kimball, Vance A.: *See—*
Carr, Keith E.; and Kimball, Vance A., 4,180,049, Cl. 126-21.00A.

Kimura, Kunio: *See—*
Nishino, Atsushi; Sonetaka, Kazunori; Kimura, Kunio; and Watanabe, Yoshihiro, 4,180,482, Cl. 252-455.00R.

Kimura, Muneaki: *See—*
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,180,404, Cl. 430-284.000.

Kimura, Takeo: *See—*
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,180,404, Cl. 430-284.000.

Kincaid, Elmo, Jr. Automatic steam pressure generator. 4,179,879, Cl. 60-39.09R.

King, Everett R.: *See—*
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., 4,180,757, Cl. 313-315.000.

Kingsley, Charles E., to Arens Controls, Inc. Compound bow stringing. 4,180,045, Cl. 124-90.000.

Kingsley, Jack D., to General Electric Company. X-ray detector. 4,180,737, Cl. 250-367.000.

Kinkade, Franklin C. Trenching machine. 4,179,829, Cl. 37-94.000.

Kinsolving, C. Richard: *See—*
Carr, Albert A.; and Kinsolving, C. Richard, 4,180,583, Cl. 424-267.000.

Kirkgasser, James P.; and Goldsmith, Arthur C., to K-G Devices Corporation. Ribbon cable splitting device. 4,179,964, Cl. 83-599.000.

Kirkpatrick, Robert G.; and Snyder, Ronald R., to General Electric Company. Clamp. 4,179,978, Cl. 89-12.000.

Kirn, Dieter: *See—*
Steinbrenner, Ulrich; Kirn, Dieter; and Schnurle, Hans, 4,180,025, Cl. 123-32.0EA.

Kirsch, Axel. Device for milling slots in a jawbone for mounting an endossal device. 4,179,810, Cl. 433-75.000.

Kirwan, George B., to Intermodal Concepts, Inc. Rail-highway intermodal freight carrier transport system. 4,179,997, Cl. 410-53.000.

Kito, Masahiro; and Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake booster. 4,179,980, Cl. 91-6.000.

Kiuchi, Michio: *See—*
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,180,188, Cl. 222-368.000.

Klatt, Karl-Heinz; and Kussel, Eckard, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Turbomolecular pump. 4,180,370, Cl. 415-90.000.

Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of 4,4-isopropylidene-bis'(2,6-dibromophenol). 4,180,684, Cl. 568-726.000.

Klesius, Phillip H.; and Fudenberg, Herman H., to United States of America, Agriculture. Process for in vivo transfer of cell-mediated immunity in mammals with alcoholic precipitates of Bovine Transfer factor. 4,180,627, Cl. 435-262.000.

Klockler, Robert: *See—*
Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, 4,179,911, Cl. 72-78.000.

Klus, Charles: *See—*
Culina, William; and Klus, Charles, 4,179,912, Cl. 72-196.000.

Knight, Derek I.: *See—*
Fitzgerald-Smith, James P.; and Knight, Derek I., 4,180,364, Cl. 414-350.000.

Knodel, Robert R. Information reminding device. 4,179,833, Cl. 40-21.00C.

Kobayashi, Akio; Endo, Kunio; and Omori, Norio, to Nippondenso Co., Ltd. Electronically-controlled fuel injection system for internal combustion engine having odd numbers of cylinders. 4,180,023, Cl. 123-32.0EA.

Kobayashi, Makiko: *See*—
Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, 4,180,672, Cl. 560-15.000.

Kobayashi, Toshimasa: *See*—
Takaba, Toshio; and Kobayashi, Toshimasa, 4,179,800, Cl. 29-625.000.

Koblanski, John N., to Ocean Ecology Ltd. Sound measuring device. 4,179,937, Cl. 73-646.000.

Koch, Carl; and Meyer, Rolf. Apparatus for varying picture size before or after film advance. 4,180,314, Cl. 354-159.000.

Koch, Ullrich: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Kochendoerfer, Ernst: *See*—
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.

Koehn, William C.: *See*—
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000.

Koenderink, Ernest J. E.: *See*—
Hagedoorn, Rijnder; and Koenderink, Ernest J. E., 4,180,843, Cl. 361-119.000.

Koenig, Richard W.; Girard, Philip R.; and Neuhauser, Alfred J., to J. C. Penney Corporation, Inc., The. Automatic inventorying system. 4,180,204, Cl. 235-385.000.

Koerfer, Kurt: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Koeslin, Werner H., to Caterpillar Tractor Co. Watercooled exhaust manifold and method of making same. 4,179,884, Cl. 60-321.000.

Koike, Masahiko: *See*—
Takahashi, Toshiyuki; Koike, Masahiko; and Suzuki, Haruyuki, 4,179,971, Cl. 84-1.240.

Koizumi, Akio; Nakazawa, Hiroshi; and Ohsawa, Mitsuo, to Sony Corporation. Control circuit for use in a switching-type regulator. 4,180,852, Cl. 363-49.000.

Koji, Kuroyanagi: *See*—
Kazuo, Yamashita; Koji, Kuroyanagi; and Naoki, Matsuo, 4,180,590, Cl. 426-18.000.
Kazuo, Yamashita; Koji, Kuroyanagi; Yoshitsugu, Minamikawa; and Yasuhiro, Tanabe, 4,180,591, Cl. 426-18.000.

Kojima, Minoru: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,180,631, Cl. 521-164.000.

Kokkoman Shoyu Co., Ltd.: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,180,188, Cl. 222-368.000.

Kolarik, Robert V.: *See*—
Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., 4,179,979, Cl. 89-36.00A.

Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, to Bayer Aktiengesellschaft. Control valve having a low noise throttling device. 4,180,100, Cl. 137-625.300.

Kolka, Leigh E. Exercising device for runners. 4,180,261, Cl. 272-119.000.

Kolombos, Alexander J.: *See*—
Davies, Evan E.; and Kolombos, Alexander J., 4,180,689, Cl. 585-407.000.

Kolthoff, C. Paul, Jr.: *See*—
Beck, Harold D.; and Kolthoff, C. Paul, Jr., 4,180,130, Cl. 165-124.000.

Komori, Kazuaki; and Kaiyoh, Hirofumi, to Nippon Telegraph & Telephone Public Corporation. Character recognition and communication system. 4,180,798, Cl. 340-146.30H.

Kondo, Hiroyuki: *See*—
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.

Kone Osakeyhtio: *See*—
Heikkinen, Urho, 4,180,109, Cl. 144-208.00D.

Konishi, Yoshimune: *See*—
Hobo, Nobuhito; Suzuki, Yutaka; Naito, Takashi; and Konishi, Yoshimune, 4,180,037, Cl. 123-139.00E.

Konnerth, Wilhelm. Method of and a device for measuring the pressure and abrasion sensitivity of granular material (grain lots) due to mechanical stress. 4,179,916, Cl. 73-7.000.

Konrath, Karl: *See*—
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.

Kopis, Floyd B. Method of applying liquid to solid surfaces. 4,180,601, Cl. 427-238.000.

Koppel, Gary A.: *See*—
Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., 4,180,507, Cl. 260-245.400.

Korb, Donald R.: *See*—
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,180,308, Cl. 351-160.00H.

Kori, Seiji: *See*—
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 6-n-Propyl-8-methoxy-methyl or methylmercaptomethylergolines and related compounds as prolactin inhibitors and to treat Parkinson's syndrome. 4,180,582, Cl. 424-261.000.

Koska, Herschel O.: *See*—
Wilson, Woodrow A.; and Koska, Herschel O. (said Woodrow A. Wilson assors. to), 4,179,877, Cl. 58-56.000.

Kosugi, Masao; and Ogata, Takashi, to Nippon Gakki Seizo Kabushiki Kaisha. Process of manufacturing semiconductor devices. 4,179,794, Cl. 29-580.000.

Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, to Matsushita Electric Industrial Co., Ltd. Method of and a system for color separation. 4,180,330, Cl. 356-425.000.

Koucky, Robert W.: *See*—
Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., 4,179,881, Cl. 60-39.710.

Kovbasjuk, Valentin I.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.

Koyanagi, Shunichi; Shimizu, Toshihide; and Fushimi, Kenji, to Shin-Etsu Chemical Co., Ltd. Polymerizing vinyl chloride with lowering of scale formation. 4,180,634, Cl. 526-62.000.

Kragt, Gerald A., to Jer Manufacturing, Inc. Method of fabricating a building. 4,179,788, Cl. 29-407.000.

Kramer, Petrus A.: *See*—
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,180,520, Cl. 260-465.00R.

Kramer, Ted J.: *See*—
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., 4,180,605, Cl. 428-76.000.

Kraska, Robert E.; and Lessar, Joseph F., to Medtronic, Inc. Alloy composition and brazing therewith, particularly for ceramic-metal seals in electrical feedthroughs. 4,180,700, Cl. 174-152.0GM.

Krautkramer-Branson, Inc.: *See*—
Primbsch, Erik, 4,180,324, Cl. 356-35.500.

Kreibich, Ursula: *See*—
Schmid, Rolf; and Kreibich, Ursula, 4,180,527, Cl. 525-115.000.

Krishnan, Ravi C.; and Blackburn, Charles M., to Sigma Systems, Inc. High speed batch counting apparatus. 4,180,153, Cl. 198-425.000.

Krulik, Gerald A.: *See*—
Jameson, Melvin N.; and Krulik, Gerald A., 4,180,480, Cl. 252-429.00R.

Krumm, Helmut: *See*—
Oustin, Georges; and Krumm, Helmut, 4,180,426, Cl. 156-104.000.

Krupp-Koppers GmbH: *See*—
Geidies, Ulrich, 4,180,353, Cl. 406-74.000.

Kuchenbecker, Morris W., to American Can Company. Blister package. 4,180,165, Cl. 206-461.000.

Kudo, Masakuni: *See*—
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.

Kueffner Products, Inc.: *See*—
Kuffner, Reinhold O., 4,179,849, Cl. 49-505.000.

Kuffner, Reinhold O., to Kueffner Products, Inc. Door frame assembly. 4,179,849, Cl. 49-505.000.

Kuhn, Franz J.: *See*—
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Kuhn, S.A.: *See*—
Gerlinger, Frederic, 4,179,872, Cl. 56-366.000.

Kumai, Teruo: *See*—
Saiki, Junichi; and Kumai, Teruo, 4,180,035, Cl. 123-119.00A.

Kumazawa, Shunichi: *See*—
Yanagimoto, Akira; Kumazawa, Shunichi; and Takakuwa, Yasuo, 4,180,496, Cl. 260-45.8NT.

Kunczynski, Jan K. Suspended articulated chairlift mounting assembly. 4,179,994, Cl. 105-150.000.

Kuntze, Richard A.: *See*—
Glass, Roger W.; and Kuntze, Richard A., 4,180,433, Cl. 162-3.000.

Kunzmann, Peter: *See*—
Burkhard, Kurt; and Kunzmann, Peter, 4,180,622, Cl. 428-564.000.

Kupperman, Dennis: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,179,841, Cl. 46-94.000.

Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Toy object that propels forward, submerges and surfaces. 4,179,841, Cl. 46-94.000.

Kurimoto, Naohiko: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.

Kurokawa, Tadashi: *See*—
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, 4,180,588, Cl. 424-319.000.

Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, to Teijin Limited. 2-Organothio-2-cyclopentenones, organothio-cyclopentanes derived therefrom. 4,180,672, Cl. 560-15.000.

Kuseski, Robert E.: *See—*
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Kussel, Eckard: *See—*
Klatt, Karl-Heinz; and Kussel, Eckard, 4,180,370, Cl. 415-90.000.

Kutter, Dolphe, to Boehringer Mannheim GmbH. Device for staining biological materials. 4,180,060, Cl. 128-760.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Tamura, Gakuzo; and Shimizu, Kenichi, 4,180,436, Cl. 435-119.000.

La Telemecanique Electrique: *See—*
Lerude, Gerard, 4,180,304, Cl. 339-196.00M.

Lacroix, Bernard, to Cycles Peugeot. Inertia-actuated starter for an explosion engine. 4,180,743, Cl. 290-38.00B.

Ladin, Eli M.; and Reynolds, Mark P., to Federal-Mogul Corporation. Method of making a clutch throw-out bearing assembly. 4,179,780, Cl. 29-149.50R.

Lagaly, Werner: *See—*
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.

LaManna, Richard J.; Drillick, Jacob H.; and Polad, Michael D., to Data Card Corporation. Automatic embossing system with document transfer. 4,180,338, Cl. 400-582.000.

Lamb, Terrence R. Adjustable frame for stretching sheet material. 4,179,830, Cl. 38-102.500.

Lambert Corporation: *See—*
Florer, Richard H.; Via, Thomas E.; and Weaver, James M., 4,180,184, Cl. 222-41.000.

Landolt, Bruno, to Inauen Maschinen AG. Vacuum packing machine with bag end retractor. 4,179,862, Cl. 53-86.000.

Lang, Charles R., Jr.: *See—*
Armstrong, Rolfe D.; and Lang, Charles R., Jr., 4,180,861, Cl. 364-900.000.

Lang-Ree, Nils, to NPI Corporation. Shaft mounting. 4,179,948, Cl. 74-242.15R.

Lang-Ree, Nils: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,179,985, Cl. 99-339.000.

Lang, William H.: *See—*
Chang, Clarence D.; and Lang, William H., 4,180,516, Cl. 260-449.00R.

Langbein, Adolf: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Langhorst, Carsten. Hinged binder assembly for sample cards. 4,180,341, Cl. 402-80.00R.

Langrehr, Larry L.; and Watson, Charles J., to Bell & Howell Company. Control system for photographic film printer. 4,180,321, Cl. 355-83.000.

Langvik, Sigmund C., to Scanmec A/S. Vacuum separator having staggered filtrate tubes. 4,180,461, Cl. 210-333.00A.

Laniere S.A.: *See—*
Michels, Fausto, 4,180,169, Cl. 211-13.000.

Larkin, Derek J. Sewer connector. 4,180,102, Cl. 138-106.000.

Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, to Parca Norrahammar AB. Heating boiler. 4,180,018, Cl. 122-225.00R.

Laufer, Helmut: *See—*
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.

Lauredan, Bernier. Nutritive seamoss composition and method for preparing same. 4,180,595, Cl. 426-575.000.

Lavigne, Jean C.; and Segeral, Gerard, to Schlumberger Technology Corporation. Method and apparatus for providing repeatable wireline depth measurements. 4,179,817, Cl. 33-129.000.

Lawton, William R., to Graphic Controls Corporation. Heat-sensitive recording composition with mixed color precursors. 4,180,405, Cl. 106-14.500.

Layher, Eberhard. Arrangement for connecting structural members. 4,180,342, Cl. 403-24.000.

Leavitt, David R.; and Pfieffer, Gerald R., to Container Corporation of America. Carton having reclosable spout. 4,180,167, Cl. 206-622.000.

Lebet, Jean-Philippe; and Droz, Jean-Claude, to Gillette Company, The. Alarm circuit. 4,180,808, Cl. 340-384.00E.

Lederman, Frank L.; and Tiemann, Jerome J., to General Electric Company. Transmit-receive transducer array and ultrasonic imaging system. 4,180,792, Cl. 367-7.000.

Lednicer, Daniel, to Upjohn Company, The. 4-Pyrrolidino-cyclohexanone ketals. 4,180,584, Cl. 424-274.000.

Lee, Alan J. C.; and Ling, Robin S. M., to National Research Development Corporation. Surgical apparatus. 4,180,254, Cl. 269-328.000.

Lee, Cyril A., to E M I Limited. Security material and secure document system using said material. 4,180,207, Cl. 235-493.000.

Lee, James R.: *See—*
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., 4,180,605, Cl. 428-76.000.

Lefebvre, Jean H., to Regie Nationale des Usines Renault. Low pressure molten metal casting device. 4,180,121, Cl. 164-152.000.

Lefort, Marcel: *See—*
Bargain, Michel; and Lefort, Marcel, 4,180,515, Cl. 260-448.20Q.

Le Guen, Yves; and Thiault, Georges, to Produits Chimiques Auxiliaires et de Synthese, P.C.A.S. Method for preparing thienylacetic acids. 4,180,510, Cl. 549-79.000.

Lehr, Erich: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Leifheit International Gunter Leifheit GmbH: *See—*
Schulein, Rolf G., 4,180,229, Cl. 248-363.000.

Lemelson, Jerome H. Inflatable displays. 4,179,832, Cl. 40-540.000.

Lenk, Erich; and Bauer, Karl, to Barmag Barmer Maschinenfabrik AG. Inductively heatable godet with insulating means. 4,180,717, Cl. 219-10.49A.

Leonard, John J.; and Shalit, Harold, to Atlantic Richfield Company. Preparation and recovery of methacrylic acid from an aqueous sodium methacrylate solution. 4,180,681, Cl. 562-600.000.

Leonova, Galina G.: *See—*
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., 4,180,402, Cl. 430-394.000.

Le Page, Jean-Francois: *See—*
Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, 4,180,453, Cl. 208-57.000.

Lerude, Gerard, to La Telemecanique Electrique. Dissemblable multipart electrical connector. 4,180,304, Cl. 339-196.00M.

Leseur, Andre: *See—*
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.

Lessar, Joseph F.: *See—*
Kraska, Robert E.; and Lessar, Joseph F., 4,180,700, Cl. 174-152.0GM.

Leuven Research & Development V.Z.W.: *See—*
Collen, Desire J., 4,180,437, Cl. 435-7.000.

Lever Brothers Company: *See—*
Tokosh, Richard; and Cahn, Arno, 4,180,470, Cl. 252-121.000.

Levy, Stephen, to United States of America, Army. Geiger-Mueller tube with a re-entrant insulator at opposing sealed ends thereof. 4,180,754, Cl. 313-93.000.

Lew, Henry Y., to Chevron Research Company. Nitrothiophene-accelerated lactam polymerization. 4,180,650, Cl. 528-313.000.

Lewis, Charles T., Jr.; and Prescott, Gerald F., to Texaco Inc. Converting reactive impurities in isobutane charge stream with catalyst phase in sulfuric acid alkylation. 4,180,696, Cl. 585-717.000.

Li, Hsin L.; Oswald, Hendrikus J.; and Mumford, Robin B., to Allied Chemical Corporation. Cartridge takeup apparatus. 4,180,214, Cl. 242-47.000.

Li, Jorge P.: *See—*
Becker, Frank C.; and Li, Jorge P., 4,180,508, Cl. 260-326.50C.

Lichtenberger, William J., to Westinghouse Air Brake Company. Vital movable electricl contact arrangement. 4,180,715, Cl. 200-246.000.

Liebenow, Walter: *See—*
Fritschi, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, 4,180,578, Cl. 424-251.000.

Liebling, Joel R. Hamper bag cover. 4,180,113, Cl. 150-7.000.

Lieptz, Nathan S. Pill-splitting implement with non-crumbling characteristic. 4,179,806, Cl. 30-124.000.

Lindblade, Roy W. Lifesaving device. 4,179,764, Cl. 9-14.000.

Lindemann, Philip J. Automatic channel scanning attachment for manual CB radio transceiver. 4,180,776, Cl. 325-25.000.

Linder, Uno K. E., to U.S. Philips Corporation. Bearing for the printing head of a matrix printer, and printing head comprising such a bearing. 4,180,333, Cl. 400-124.000.

Lindstrom, Jan N.: *See—*
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, 4,180,400, Cl. 75-235.000.

Lindstrum, Alan L., to United States of America, Navy. PSK pulse synthesizer. 4,180,793, Cl. 367-137.000.

Ling, Ku S.: *See—*
Diamond, Ronald M.; Ling, Ku S.; and Winterer, Allen G., 4,180,414, Cl. 136-89.0PC.

Ling, Robin S. M.: *See—*
Lee, Alan J. C.; and Ling, Robin S. M., 4,180,254, Cl. 269-328.000.

Lingl Corporation: *See—*
Lingl, Hans, Jr., 4,179,959, Cl. 83-37.000.

Lingl, Hans, Jr., to Lingl Corporation. Method and apparatus for the cutting of split tiles. 4,179,959, Cl. 83-37.000.

Lion Fat & Oil Co., Ltd., The: *See—*
Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, 4,180,468, Cl. 252-117.000.

Lippert, Joseph, Jr., to Grumman Corporation. Wind rotor automatic air brake. 4,180,372, Cl. 416-23.000.

Lipschutz, Paul, to Neiman S.A. Process for producing a piston-type safety lock device. 4,179,789, Cl. 29-412.000.

Litton Systems, Inc.: *See—*
Craig, Robert J. G., 4,179,818, Cl. 33-321.000.

Ljubimov, Grigory A.: *See—*
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.

Llenado, Ramon A., to Procter & Gamble Company, The. Spray-dried detergent compositions. 4,180,485, Cl. 252-532.000.

Lloyd, David J. Fuel-air mixture regulator for internal combustion engines. 4,180,042, Cl. 123-141.000.

Lobbe, Armin; and Penzek, Hans-Jurgen, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,180,291, Cl. 299-34.000.

Lockheed Aircraft Corporation: *See—*
Thornburg, Francis L., 4,180,222, Cl. 244-75.00R.

Lockheed Corporation: *See—*
Ryle, Dallas M., Jr., 4,180,224, Cl. 244-136.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Adams, George B., 4,180,623, Cl. 429-21.000.
Loctite Corporation: *See*—
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., 4,180,640, Cl. 526-323.100.
Loeck, Harald: *See*—
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.
Lollar, Elizabeth D.: *See*—
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.
Long, Steven K. Golf putting training apparatus. 4,180,270, Cl. 273-186.00R.
Long, Wesley A., to Beckmann, Karen L. Method for forming a heat exchanger core. 4,179,781, Cl. 29-157.30R.
Longinotti, Enrico. Plant for handling cement tiles and similar articles that require a seasoning and subsequent workings. 4,180,361, Cl. 414-32.000.
Lonsdale, Alice, to Safeway Stores, Incorporated. Touch checking key tops for keyboard. 4,180,336, Cl. 400-491.300.
Lonza Ltd.: *See*—
Sencar, Drago, 4,180,447, Cl. 204-159.170.
Losert, Wolfgang: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.
Louth, Kenneth; and Gallo, Luigi C., to Ampex Corporation. Phase lock loop for data decoder clock generator. 4,180,701, Cl. 178-69.100.
Lovering, David G.; and Turnbull, James H., to Multicore Solders Limited. Soft soldering. 4,180,616, Cl. 428-389.000.
Lowe, Philip J.: *See*—
Buckley, Keith; Vernon, Alan; and Lowe, Philip J., 4,180,592, Cl. 426-32.000.
Lowrance, Thomas F. Apparatus for inserting sticks into articles. 4,180,198, Cl. 227-120.000.
LTG Lufttechnische GmbH: *See*—
Furstenberg, Joachim, 4,180,390, Cl. 55-272.000.
Lucas, Charles. Goggles. 4,179,756, Cl. 2-434.000.
Luckenbach, Edward C., to Exxon Research & Engineering Co. Method for combusting carbon monoxide in a fluid catalytic cracking process. 4,180,454, Cl. 208-113.000.
Ludwig Heumann, & Co. GmbH: *See*—
Fritschi, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, 4,180,578, Cl. 424-251.000.
Lummus Company, The: *See*—
O'Sullivan, Thomas F.; and Pollock, William H., 4,180,019, Cl. 122-235.00N.
Lundquist, Robert H. Vacuum cleaner attachment for vacuuming liquids. 4,179,769, Cl. 15-353.000.
Lundstrom, John W., to Bindicator Company. Method and apparatus for sampling and measuring a characteristic of flowing granular material. 4,180,331, Cl. 356-445.000.
Lupke, Gerd P. H.; and Lupke, Manfred A. A. Apparatus and method for perforating tubing and method of producing part of such apparatus. 4,180,357, Cl. 409-131.000.
Lupke, Manfred A. A.: *See*—
Lupke, Gerd P. H.; and Lupke, Manfred A. A., 4,180,357, Cl. 409-131.000.
Lutz, Kenneth V. Tungsten carbide impregnator. 4,180,719, Cl. 219-125.120.
Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., to Switchcraft, Inc. Slide switch. 4,180,712, Cl. 200-16.00D.
Luybli, Richard E.: *See*—
Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., 4,179,897, Cl. 62-9.000.
M. Lowenstein & Sons, Inc.: *See*—
Hance, Charles M.; and Martin, Charles D., 4,180,606, Cl. 428-88.000.
M. W. Dunton Company: *See*—
Thompson, Floyd A., Jr., 4,180,419, Cl. 148-23.000.
MacFee, Norman W., to Textron Inc. Method of forming a bottom stop on a slide fastener. 4,179,787, Cl. 29-408.000.
Machinami, Tomoya: *See*—
Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, 4,180,655, Cl. 536-17.00R.
Mack Trucks, Inc.: *See*—
Taylor, Joe N., 4,180,027, Cl. 123-41.350.
MacLaury, Michael R., to General Electric Company. Dehydrochlorination of a dihydroxydiphenyl trichloroethane. 4,180,685, Cl. 568-726.000.
MacLean, Donald L.: *See*—
Graham, Tommy E.; and MacLean, Donald L., 4,180,388, Cl. 55-16.000.
Graham, Tommy E.; and MacLean, Donald L., 4,180,552, Cl. 423-359.000.
Maclean, Robert D., to National Distillers and Chemical Corporation. Antiblock system and process aid for vulcanized vinyl acetate ethylene copolymers. 4,180,490, Cl. 260-23.00R.
Madison Ltd.: *See*—
Ho, Yin F., 4,179,843, Cl. 46-126.000.
Maeda, Yoshio; Matsumoto, Koichi; and Kamitake, Seigo, to Hitachi. Ltd. Spectrophotometers with digital processing. 4,180,327, Cl. 356-320.000.
Maeder, Edward G., to National Can Corporation. Domer assembly for ironing machine. 4,179,909, Cl. 72-45.000.
Maegawa, Muneo: *See*—
Takagi, Nobuho; Maegawa, Muneo; and Nii, Katsutoshi, 4,180,273, Cl. 277-154.000.
Mageli, Orville L.; and Swarts, William A., to Pennwalt Corporation. Peroxy compounds. 4,180,518, Cl. 260-453.0RZ.
Magney, Herbert C. Combination dispenser-disposal cartridge for a surgical blade. 4,180,162, Cl. 206-363.000.
Magnussen, Haakon T., Jr., to Altex Scientific, Inc. Liquid chromatography pump. 4,180,375, Cl. 417-22.000.
Mahan, John E.: *See*—
Fahey, Darryl R.; and Mahan, John E., 4,180,525, Cl. 585-523.000.
Maier, Michael W.; and Polzin, James J., to Malleable Iron Range Company. Furnace. 4,180,051, Cl. 126-77.000.
Maiocchi, Luigi. Radial tires. 4,180,116, Cl. 152-362.00R.
Makhlouf, Joseph M.; and Porter, Samuel, Jr., to PPG Industries, Inc. Crosslinked acrylic polymer microparticles. 4,180,619, Cl. 526-202.000.
Malinowski, William J., to Chloride Incorporated. Detector with supervisory signal from monitor cell. 4,180,742, Cl. 250-574.000.
Mallams, Alan K.; and Davies, David H., to Schering Corporation. 1-N-substituted derivatives of 4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitols. 4,180,565, Cl. 424-180.000.
Malleable Iron Range Company: *See*—
Maier, Michael W.; and Polzin, James J., 4,180,051, Cl. 126-77.000.
Mallett, Raymond H. Water shutoff system. 4,180,088, Cl. 137-87.000.
Mallorca, Salvador C.: *See*—
Hoenig, James R.; and Mallorca, Salvador C., 4,180,179, Cl. 220-307.000.
Manas, Spero G.: *See*—
Bouverie, William M.; and Manas, Spero G., 4,179,922, Cl. 73-116.000.
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., to Syntex (USA) Inc. Contact lens. 4,180,308, Cl. 351-160.00H.
Manners, David E.: *See*—
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.
Mannesmann Aktiengesellschaft: *See*—
Ridder, Gerhard; and Schafer, Wilhelm, 4,179,887, Cl. 60-420.000.
Mansmann, Manfred, to Bayer Aktiengesellschaft. Thermally stable quartz glass. 4,180,409, Cl. 106-39.600.
Mantle, Harold: *See*—
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, 4,180,400, Cl. 75-235.000.
Marchant, David D., to United States of America, Energy. Ceramic component for electrodes. 4,180,484, Cl. 252-521.000.
Marchant, Wayne N.; and Brooks, Parkman T., to United States of America, Interior. Resin for sorption of tungsten. 4,180,628, Cl. 521-39.000.
Marcilly, Christian, to Institut Francais du Petrole. New preparation process of a catalyst for converting aromatic hydrocarbons. 4,180,693, Cl. 585-475.000.
Marinoff, Gerald P. Ophthalmological surgical instrument. 4,180,075, Cl. 128-305.000.
Mark, Victor, to General Electric Company. Polycarbonate composition having resistance to high heat distortion. 4,180,651, Cl. 528-202.000.
Marquis, Edward T.; and Yeakey, Ernest L., to Texaco Development Corp. Polyurethane chain-extenders. 4,180,644, Cl. 528-68.000.
Mars Limited: *See*—
Buckley, Keith; Vernon, Alan; and Lowe, Philip J., 4,180,592, Cl. 426-32.000.
Marsh, David R., to Singer Company, The. Simulation of an object system formed by polygon faces having a series of fundamental shapes and dimension. 4,179,824, Cl. 35-10.240.
Marsh, David R.: *See*—
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.
Marsh, Ronald W.: *See*—
Gutridge, Jack E.; and Marsh, Ronald W., 4,179,996, Cl. 105-345.000.
Marshall, Neal H., to Bose Corporation. Loudspeaker porting. 4,180,140, Cl. 181-156.000.
Marshall, Sidney; and Zeto, Robert J., to United States of America, Army. Low temperature CMOS/SOS process using dry pressure oxidation. 4,179,792, Cl. 29-571.000.
Martin, Charles D.: *See*—
Hance, Charles M.; and Martin, Charles D., 4,180,606, Cl. 428-88.000.
Martt, Judson W., to National Steel Corporation. Metal strip tensioning apparatus for use in continuous strip reduction cold mill and method. 4,179,913, Cl. 72-205.000.
Martucci, Frank. Time variable thermostat. 4,180,789, Cl. 337-301.000.
Masaki, Hideyuki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for producing a silicon nitride base sintered body. 4,180,410, Cl. 106-73.200.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Caspers, Karl-Heinz, 4,180,396, Cl. 75-53.000.
Mason, Donald R., to Harris Corporation. Heteroepitaxial deposition of GaP on silicon substrates. 4,180,825, Cl. 357-16.000.
Masters, Harvey M., to Westinghouse Electric Corp. Programmable test point selector circuit. 4,180,203, Cl. 235-302.000.
Masuda, Bunpei: *See*—
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000.

Mathews, Donald C. Animal feeder. 4,180,014, Cl. 119-52.00R.

Matjurin-Veretennikov, Leonid I.: *See*—
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.

Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, to Bridgestone Tire Company, Limited; and Mitaka Instrument Company Limited. Alarm device for informing reduction of pneumatic pressure of tire. 4,180,795, Cl. 340-58.000.

Matsumoto, Fuyuhiko; and Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Multi-copying method and multi-copying apparatus. 4,180,318, Cl. 355-11.000.

Matsumoto, Kazuya: *See*—
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.

Matsumoto, Koichi: *See*—
Maeda, Yoshio; Matsumoto, Koichi; and Kamitake, Seigo, 4,180,327, Cl. 356-320.000.

Matsumoto, Kuniaki: *See*—
Miyaoka, Shinichiro; Matsumoto, Kuniaki; and Hatakeyama, Junichi, 4,180,083, Cl. 137-101.250.

Matsumoto, Takao: *See*—
Nagata, Takeo; Satoh, Seisuke; and Matsumoto, Takao, 4,180,626, Cl. 435-144.000.

Matsumoto, Yoshio: *See*—
Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, 4,180,652, Cl. 525-437.000.

Matsumura, Yasuhide: *See*—
Inoyama, Tadao; Matsumura, Yasuhide; and Nagano, Yukio, 4,179,783, Cl. 29-281.500.

Matsuoka, Kazuhiro: *See*—
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, 4,180,811, Cl. 340-566.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Nishino, Atsushi; Sonetaka, Kazunori; Kimura, Kunio; and Watanabe, Yoshihiro, 4,180,482, Cl. 252-455.00R.

Matsushita Electric Works, Ltd.: *See*—
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, 4,180,811, Cl. 340-566.000.

Matsuzaka Company Ltd.: *See*—
Endo, Makoto, 4,180,213, Cl. 241-192.000.

Matte, Jacques R. Electrical outlet box support. 4,180,226, Cl. 248-27.100.

Matthews, Leslie C. Variable ratio crank assembly. 4,179,942, Cl. 74-43.000.

Matula, Jerry, to Printronix, Inc. Reciprocating linear drive mechanism. 4,180,766, Cl. 318-128.000.

Matuoka, Tosimitu: *See*—
Miyazaki, Hiroaki; Sakai, Yasuo; and Matuoka, Tosimitu, 4,180,041, Cl. 123-141.000.

Maurer, Gerald L.; and Shringarpurey, Sudhir K., to National Research Laboratories. Method of transporting metal ions. 4,180,473, Cl. 252-182.000.

Maurhoff, Gerhard: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.

Maxcap, Inc.: *See*—
Virog, John J., Jr.; and Von Hagel, Leo, 4,180,175, Cl. 215-252.000.

Maximenko, Vladilen I.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.

Maxson, Dale E., to Barber-Colman Company. Multiple heat pipe heat exchanger and method for making. 4,180,127, Cl. 165-76.000.

Maynard, Michael; and Jones, Walter, to Gestetner Limited. Pressure-sensitive duplicating stencil. 4,180,621, Cl. 428-535.000.

Maytham, Walter J., to Speed Systems, Inc. Adjustable roller cable feeding and stripping tool. 4,179,804, Cl. 30-90.700.

Mazier, Paul, to S.F.Z. Souplesse Fonctionnelle Systematique. Apparatus for manufacturing deformable expansion bellows for pipe-work. 4,179,910, Cl. 72-59.000.

McAllister, Richard L.: *See*—
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., 4,180,860, Cl. 364-900.000.

McBride, Jerald R.: *See*—
Graham, Robert H.; and McBride, Jerald R., 4,179,866, Cl. 53-468.000.

McCain Manufacturing Co.: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,180,259, Cl. 271-200.000.

Mc Cain, Willam B.: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,180,259, Cl. 271-200.000.

McCarthy, Cornelius J. D.: *See*—
Morton, Roger R. A.; and McCarthy, Cornelius J. D., 4,180,831, Cl. 358-160.000.

McClenny, Carl O. Freezers. 4,179,904, Cl. 62-342.000.

McClung, Harold A.: *See*—
Thomas, Harold A., 4,179,834, Cl. 43-57.50R.

McClure, James D., to Shell Oil Company. Isoparaffin alkylation process using an unsupported perfluorinated polymer catalyst. 4,180,695, Cl. 585-730.000.

McCollough, John D., to Delta Microfilm. Photographic apparatus for use in making printing plates. 4,180,320, Cl. 355-54.000.

McCombie, Alan K.; and Temple, Stephen, to Cambridge Consultants of Bar Hill. Web transport mechanism and method. 4,180,194, Cl. 226-113.000.

McCombie, Jay C.: *See*—
Khair, Magdi K.; and McCombie, Jay C., 4,180,022, Cl. 123-32.0AE.

McCormack, William B.; and Sandy, Charles A., to Du Pont de Nemours, E. I., and Company. Hexacoordinated transition metal compounds containing at least one polyfluoroalkyl substituent. 4,180,386, Cl. 44-63.000.

McCowan, Lida L. Device for treating swollen surface areas on horses and the like. 4,180,077, Cl. 128-402.000.

McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., to Tennessee Valley Authority. Uranium recovery from wet-process phosphoric acid. 4,180,545, Cl. 423-8.000.

McDermott, Julian A.; and McDermott, Kevin. Mount for vehicular warning lights. 4,180,010, Cl. 116-209.000.

McDermott, Kevin: *See*—
McDermott, Julian A.; and McDermott, Kevin, 4,180,010, Cl. 116-209.000.

McDonnell Douglas Corporation: *See*—
Byrd, Norman R., 4,180,442, Cl. 204-14.00N.

McGean Chemical Company, Inc.: *See*—
Jameson, Melvin N.; and Krulik, Gerald A., 4,180,480, Cl. 252-429.00R.

McIntire, Floyd C.: *See*—
Patterson, Roy; and McIntire, Floyd C., 4,180,562, Cl. 424-91.000.

McKechnie, John C., to United States of America, Navy. Terrain contour tracking system. 4,179,919, Cl. 73-37.500.

McMurchie, Thomas. Squiggle game. 4,180,271, Cl. 273-275.000.

McNally, George S., to Pullman Incorporated. Center filler for railway vehicle. 4,180,001, Cl. 105-420.000.

McPherson, Robert: *See*—
Hsu, William W.; and McPherson, Robert, 4,180,243, Cl. 251-234.000.

McRae, Wayne A., to Ionics Inc. Apparatus for treating whey. 4,180,451, Cl. 204-301.000.

McShane, Lawrence J.: *See*—
Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., 4,180,507, Cl. 260-245.400.

McWhirter, John A. Valve lock assembly. 4,180,030, Cl. 123-90.670.

MDT Instrument Company: *See*—
Runnells, Robert R.; and Schmoegner, John C., 4,179,813, Cl. 433-79.000.

Meacham, G. B. Kirby: *See*—
Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, 4,180,366, Cl. 414-540.000.

Mead Corporation, The: *See*—
Clement, Joseph J., 4,180,003, Cl. 108-144.000.
Wood, Prentice J., 4,180,191, Cl. 224-45.0BA.

Mechler, Helmut: *See*—
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.

Medin, Stanislav A.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.

Medtronic, Inc.: *See*—
Anderson, Kenneth M., 4,180,078, Cl. 128-419.0PG.
Kraska, Robert E.; and Lessar, Joseph F., 4,180,700, Cl. 174-152.0GM.

Mego Corp.: *See*—
Fauls, Thomas J., 4,179,842, Cl. 46-117.000.

Meiners, Brigitte: *See*—
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.

Meinken, Bernhard, to Freiedrich Wilhem, Schwing GmbH. Rotary tower crane for construction purposes with a distributor device for concrete. 4,180,170, Cl. 212-1.000.

Meisner, Alfred; and Gerum, Erich, to DIEHL, Firma. Automatic control for an adjustable member. 4,180,087, Cl. 137-78.000.

Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., to Loctite Corporation. Accelerator for curable acrylic ester compositions. 4,180,640, Cl. 526-323.100.

Mencacci, Samuel A., to FMC Corporation. Low liquid volume retort system. 4,179,986, Cl. 99-359.000.

Merkl, George G., to Merkl Technology, Inc. Electrolytic methods employing graphitic carbon cathodes and inorganic complexes produced thereby. 4,180,444, Cl. 204-90.000.

Merkl Technology, Inc.: *See*—
Merkl, George G., 4,180,444, Cl. 204-90.000.

Merrell Toraude et Compagnie: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,180,509, Cl. 260-326.14T.

Messer, Gordon J.: *See*—
Scorso, Clifford A., Jr.; and Messer, Gordon J., 4,180,853, Cl. 363-96.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Rudolph, Paul, 4,180,387, Cl. 48-206.000.

Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. α-Ethynyl tryptophanes. 4,180,509, Cl. 260-326.14T.

Meyer, Rolf: *See*—
Koch, Carl; and Meyer, Rolf, 4,180,314, Cl. 354-159.000.
Michaels, Alan S., to Alza Corporation. Device for delivering drug to biological environment. 4,180,073, Cl. 128-260.000.
Michaud, Andre, to Transac - Compagnie pour le Developpement des Transactions Automatiques. Magnetic coding method. 4,180,837, Cl. 360-18.000.
Michels, Fausto, to Laniere S.A. Window display support for finger rings. 4,180,169, Cl. 211-13.000.
Michne, William F., to Sterling Drug Inc. 2-Azabicyclo[2.2.2]oct-5-enes. 4,180,667, Cl. 546-112.000.
Mielke, Dennis L., to American Can Company. Apparatus for the deposition of dry fibers on a foraminous forming surface. 4,180,378, Cl. 425-83.100.
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Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.
Milkovich, Ralph: *See*—
Bi, Le-Khac; and Milkovich, Ralph, 4,180,530, Cl. 525-98.000.
Miller Brewing Company: *See*—
Chicoye, Etzer; Helbert, J. Raymond; and Rice, James F., 4,180,589, Cl. 426-11.000.
Milliken, Ralph A.; Wall, Terence D.; and Boelens, Martin, to Vital Signs, Inc. Safety interface and valve for anesthesia gas scavenging. 4,180,066, Cl. 128-205.240.
Mills, Duane M.: *See*—
Fish, Leonard A.; and Mills, Duane M., 4,180,182, Cl. 221-75.000.
Mills, William R., Jr.: *See*—
Givens, Wyatt W.; and Mills, William R., Jr., 4,180,730, Cl. 250-265.000.
Minami, Setsuo: *See*—
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.
Ministry of International Trade and Industries: *See*—
Shimokawa, Kenji; Nagatomo, Muneshige; and Tanaka, Yasuo, 4,179,895, Cl. 62-2.000.
Minnesota Mining and Manufacturing Company: *See*—
Burguette, Mario D., 4,180,673, Cl. 560-26.000.
Hampl, Edward F., Jr., 4,180,415, Cl. 136-205.000.
Minoura, Kazuo: *See*—
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.
Miquel, Jean: *See*—
Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, 4,180,453, Cl. 208-57.000.
Miquel, Pierre: *See*—
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.
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Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.
Mitchell, Lawrence C., to General Electric Company. Process for recovering 2,2-bis(4-hydroxyphenyl)propane from distillation residues from the preparation thereof. 4,180,683, Cl. 568-724.000.
Mitchell, Sharon J.; and Wise, Rodney M., to Procter & Gamble Company, The. Detergent compositions for effective oily soil removal. 4,180,472, Cl. 252-162.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, 4,180,588, Cl. 424-319.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,179,955, Cl. 81-57.110.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Idustry Co., Ltd. Apparatus for controlling the amount of secondary air fed into an internal combustion engine. 4,179,882, Cl. 60-276.000.
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Yamada, Tsuneo; and Miyamoto, Yukihiko, 4,180,777, Cl. 325-363.000.
Miyaoka, Shinichiro; Matsumoto, Kuniaki; and Hatakeyama, Junichi, to Hitachi, Ltd. System for controlling flow rate in pipelines. 4,180,083, Cl. 137-101.250.
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focal point detecting device for SLR camera. 4,180,309, Cl. 354-25.000.
Miyazaki, Hiroaki; Sakai, Yasuo; and Matuoka, Tosimitu, to Nissan Motor Company, Limited. Internal combustion engine with intake arrangement to produce swirl in combustion chamber. 4,180,041, Cl. 123-141.000.
Miyazaki, Yasushi; Suzuki, Masanori; and Kaneko, Hideaki, to Oxy Metal Industries Corporation. Post treating zinc surfaces. 4,180,406, Cl. 106-14.150.
Mizutani, Junichi: *See*—
Morikawa, Akira; Narita, Yoshinori; and Mizutani, Junichi, 4,180,538, Cl. 264-63.000.
Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Lang, William H., 4,180,516, Cl. 260-449.00R.
Givens, Wyatt W., 4,180,727, Cl. 250-264.000.
Givens, Wyatt W., 4,180,729, Cl. 250-265.000.
Givens, Wyatt W.; and Mills, William R., Jr., 4,180,730, Cl. 250-265.000.
Givens, Wyatt W., 4,180,731, Cl. 250-270.000.
Moll, Norman G.; and Quarderer, George J., to Dow Chemical Company, The. Process for recovering a premium oil from a slurry produced by high temperature hydrogenation of a solid, hydrocarbonaceous fuel. 4,180,456, Cl. 208-177.000.
Mollere, John C., to Western Geophysical Co. of America. Termination fixture for a marine seismic streamer cable. 4,180,103, Cl. 138-109.000.
Monaghan, David A.: *See*—
Divers, Edward F.; Berry, D. Randolph; and Monaghan, David A., 4,180,352, Cl. 405-303.000.
Monsanto Company: *See*—
Franz, John E.; and Kaufman, Robert J., 4,180,394, Cl. 71-86.000.
Graham, Tommy E.; and MacLean, Donald L., 4,180,388, Cl. 55-16.000.
Graham, Tommy E.; and MacLean, Donald L., 4,180,552, Cl. 423-359.000.
Null, Harold R.; and Perry, Eli, 4,180,553, Cl. 423-359.000.
Tokas, Edward F., 4,180,486, Cl. 260-4.0AR.
Montanio, Louis P. Tooth cleaning device. 4,179,814, Cl. 433-99.000.
Montedison S.p.A.: *See*—
Caporiccio, Gerardo; Bargigia, Gianangelo; and Guidetti, Giampiero, 4,180,639, Cl. 526-243.000.
Montoya, Allan. Ski attachment. 4,180,275, Cl. 280-11.37E.
Moog, Robert A., to Norlin Industries, Inc. Distortion sound effects circuit. 4,180,707, Cl. 179-1.00M.
Moore, Archie S. Multi-directional transfer device. 4,180,150, Cl. 198-366.000.
Moore, Donald J. Fluid flow controller. 4,180,099, Cl. 137-624.200.
Moore, John A.: *See*—
Cresko, Joseph V.; and Moore, John A., 4,180,847, Cl. 362-30.000.
Moore, William A.; and Przirembel, Hans R., to United Technologies Corporation. Turbine blade. 4,180,373, Cl. 416-97.00R.
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, to Mitsubishi Chemical Industries, Ltd. Immunosuppressant. 4,180,588, Cl. 424-319.000.
Morikawa, Akira; Narita, Yoshinori; and Mizutani, Junichi, to NGK Spark Plug Co., Ltd. Method of making ceramic shaped article from inorganic raw material powder by extrusion molding. 4,180,538, Cl. 264-63.000.
Morikawa, Tsukio: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Morin, Fernand; and Spector, George. Ring toss game. 4,180,266, Cl. 273-100.000.
Morita, Lawrence H.: *See*—
Barnhardt, Kenneth O.; and Morita, Lawrence H., 4,179,762, Cl. 4-191.000.
Moritani, Nakanobu, to Kabushiki Kaisha Seikosha. Controlling device for grinding piezo-electric element. 4,179,853, Cl. 51-165.00R.
Moriya, Kazuo, to Falk, Richard A. Pneumatic metal sampler. 4,179,931, Cl. 73-425.600.
Moriyama, Masakazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Digital clock for motor vehicles. 4,179,876, Cl. 58-50.00R.
Morrison, Charles F., Jr., to Vac-Tec Systems, Inc. Planar magnetron sputtering device. 4,180,450, Cl. 204-298.000.
Morton, Roger R. A.; and McCarthy, Cornelius J. D., to Bausch & Lomb Incorporated. Image analysis data extraction. 4,180,831, Cl. 358-160.000.
Morup, Poul, to Alex Grosman A/S. Control circuit for an A.C. discharge lamp. 4,180,764, Cl. 315-283.000.
Moser, Kurt: *See*—
Kaufmann, Heinrich; and Moser, Kurt, 4,180,319, Cl. 355-3.00R.
Moss, Philip H.; and Nieh, Edward C. Y., to Texaco Development Corp. Acrylamide or methacrylamide quaternary compounds. 4,180,643, Cl. 528-52.000.
Motion Control, Incorporated: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; and Hansen, Peter, 4,180,068, Cl. 128-214.00R.
Motorola, Inc.: *See*—
Cicatelli, Rodolfo, 4,180,836, Cl. 360-130.320.
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000.
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, to BASF Aktiengesellschaft. Manufacture of magnetic recording media. 4,180,597, Cl. 427-48.000.
Muchow, John D., to Valve Concepts International, Inc. Valve actuator having a rotary bi-directional apparatus with a dual ratchet mechanism. 4,180,238, Cl. 251-58.000.
Mueller, Paul; and Prine, Ray A., to Paul Mueller Company. Hot water system and condensing unit therefor. 4,179,902, Cl. 62-238.000.
Muller, Alois. Trap door for vending machine. 4,180,183, Cl. 221-194.000.
Mullett, Charles E.: *See*—
Cosgrove, John D.; Pettis, Charles D.; and Mullett, Charles E., 4,180,709, Cl. 179-2.0AM.
Multicore Solders Limited: *See*—
Lovering, David G.; and Turnbull, James H., 4,180,616, Cl. 428-389.000.

Mumford, Robin B.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Mumford, Robin B., 4,180,214, Cl. 242-47.000.
Muncheryan, Hrand M. Silent awakening system. 4,180,810, Cl. 340-407.000.
Munekata, Kenichi; Ohta, Takeshi; and Ohshima, Susumu, to Toyoda Koki Kabushiki Kaisha. Grinding machine with rest apparatus. 4,179,854, Cl. 51-165.770.
Murakami, Ryoichi: *See*—
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,180,417, Cl. 148-6.15Z.
Muranaka, Shigeo; Ochiai, Kokichi; and Waku, Makio, to Nissan Motor Company, Limited. Method and system for controlling ignition spark timing of an internal combustion engine of the multiple plugs type. 4,180,031, Cl. 123-117.00A.
Murata, Junichi: *See*—
Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.
Murphy, John B., to Hewlett-Packard Company. Electrode assembly for sensing heart activity. 4,180,080, Cl. 128-642.000.
Murry, Edward J.; and Brumbach, Joseph F., to Fibra-Sonics, Inc. Device and method for applying precise irrigation, aspiration, medication, ultrasonic power and dwell time to biotissue for surgery and treatment. 4,180,074, Cl. 128-276.000.
Murty, Vabilisetti S., to Sherwood Medical Industries Inc. Fluid collection device with phase separation means. 4,180,465, Cl. 210-516.000.
Nacci, George R.; and Pazos, Jose F., to Du Pont de Nemours, E. I., and Company. Photohardenable films having high resolution containing nitroso dimers. 4,180,403, Cl. 430-281.000.
Nachfolger, Solomon J.: *See*—
Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., 4,180,658, Cl. 544-27.000.
Nagano, Yukio: *See*—
Inoyama, Tadao; Matsumura, Yasuhide; and Nagano, Yukio, 4,179,783, Cl. 29-281.500.
Nagata, Takeo; Satoh, Seisuke; and Matsumoto, Takao, to Showa Oil Co., Ltd. Process for manufacturing citric acid from olefins by fermentation. 4,180,626, Cl. 435-144.000.
Nagata, Wataru: *See*—
Narisada, Masayuki; and Nagata, Wataru, 4,180,571, Cl. 424-248.520.
Nagatomo, Muneshige: *See*—
Shimokawa, Kenji; Nagatomo, Muneshige; and Tanaka, Yasuo, 4,179,895, Cl. 62-2.000.
Naito, Makoto; and Kasami, Akinobu, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing red light-emitting gallium phosphide device. 4,180,423, Cl. 148-171.000.
Naito, Takashi: *See*—
Hobo, Nobuhito; Suzuki, Yutaka; Naito, Takashi; and Konishi, Yoshimune, 4,180,037, Cl. 123-139.00E.
Nakada, Akira: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, 4,179,972, Cl. 84-1.110.
Nakada, Minoru: *See*—
Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, 4,180,804, Cl. 340-310.00R.
Nakagawa, Yasuharu, to Topla, Ltd. Marble-patterned bathtub, basin or sink. 4,179,760, Cl. 4-166.000.
Nakamoto, Kisaburo. Solderless bell and method of forming a solderless bell. 4,180,008, Cl. 116-170.000.
Nakamura, Kazuo: *See*—
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, 4,180,309, Cl. 354-25.000.
Nakamura, Masaaki: *See*—
Iwaki, Hiroshi; and Nakamura, Masaaki, 4,180,376, Cl. 417-360.000.
Nakamura, Noriniko: *See*—
Sanda, Shougo; Nakamura, Noriniko; and Tanahashi, Toshio, 4,180,044, Cl. 123-191.00S.
Nakamura, Takaharu: *See*—
Hamano, Sachiyuki; and Nakamura, Takaharu, 4,180,577, Cl. 424-251.000.
Nakano, Masao, to General Research of Electronics, Inc. Dipole antenna structure. 4,180,819, Cl. 343-792.000.
Nakazawa, Hiroshi: *See*—
Koizumi, Akio; Nakazawa, Hiroshi; and Ohsawa, Mitsuo, 4,180,852, Cl. 363-49.000.
Nanini, Antoine, to Societe Igman. Detachable blade for cutting tool. 4,180,355, Cl. 407-113.000.
Naoki, Matsuo: *See*—
Kazuo, Yamashita; Koji, Kuroyanagi; and Naoki, Matsuo, 4,180,590, Cl. 426-18.000.
Narisada, Masayuki; and Nagata, Wataru, to Shionogi & Co., Ltd. Arylmalonamido-1-oxadethiacephalosporins. 4,180,571, Cl. 424-248.520.
Narita, Yoshinori: *See*—
Morikawa, Akira; Narita, Yoshinori; and Mizutani, Junichi, 4,180,538, Cl. 264-63.000.
National Can Corporation: *See*—
Maeder, Edward G., 4,179,909, Cl. 72-45.000.
National Distillers and Chemical Corporation: *See*—
Maclean, Robert D., 4,180,490, Cl. 260-23.00R.
National Research Development Corporation: *See*—
Bennett, Simon D.; and Ash, Eric A., 4,179,936, Cl. 73-606.000.
Lee, Alan J. C.; and Ling, Robin S. M., 4,180,254, Cl. 269-328.000.
Smith, Kenneth C. A.; and Tee, William J., 4,180,738, Cl. 250-396.0ML.
National Research Laboratories: *See*—
Maurer, Gerald L.; and Shringarpurey, Sudhir K., 4,180,473, Cl. 252-182.000.
National Service Industries, Inc.: *See*—
Cosby, Billy Q., 4,180,340, Cl. 402-63.000.
National Steel Corporation: *See*—
Martt, Judson W., 4,179,913, Cl. 72-205.000.
Naylor, David, to British Steel Corporation. Machinable steel. 4,180,397, Cl. 75-58.000.
NCR Corporation: *See*—
Armstrong, Rolfe D.; and Lang, Charles R., Jr., 4,180,861, Cl. 364-900.000.
Speraw, Floyd G., 4,179,791, Cl. 29-526.00R.
Neagu, Petre: *See*—
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.
Neale, Christopher V.: *See*—
Wheldon, Robert J.; and Neale, Christopher V., 4,180,756, Cl. 313-193.000.
Neel, Jean; and Violland, Robert, to Rhone-Poulenc Industries. Process for obtaining and product acrylic monomers useful in the preparation of cationic flocculants. 4,180,519, Cl. 260-459.00A.
Neff, Joseph J., deceased; and by Neff, Lucille D., executrix, to Bell & Howell Company. Information reproducing apparatus. 4,180,839, Cl. 360-71.000.
Neff, Lucille D., executrix: *See*—
Neff, Joseph J., deceased; and Neff, Lucille D., executrix, 4,180,839, Cl. 360-71.000.
Neiman S.A.: *See*—
Lipschutz, Paul, 4,179,789, Cl. 29-412.000.
Schaumburg, Gunter, 4,179,908, Cl. 70-185.000.
Neisler, Boyd L.; and Stith, Joe D., to Coburn Optical Industries, Inc. Apparatus for edging ophthalmic lenses. 4,179,851, Cl. 51-101.0LG.
Nelson, Donald J.; Pistoresi, Denis J.; and Weisbach, Michael F., to Boeing Company, The. Frequency modulated electrical discharge laser. 4,180,784, Cl. 331-94.5PE.
Nerath, Gustav J.: *See*—
Wolpert, Stephen M.; and Nerath, Gustav J., 4,180,599, Cl. 427-54.100.
Neuhauser, Alfred J.: *See*—
Koenig, Richard W.; Girard, Philip R.; and Neuhauser, Alfred J., 4,180,204, Cl. 235-385.000.
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., to Sun Ventures, Inc. Method of lubrication of a controlled-slip differential. 4,180,466, Cl. 252-48.600.
Newton, George M.: *See*—
Fricko, John J.; and Newton, George M., 4,179,859, Cl. 52-397.000.
NGK Spark Plug Co., Ltd.: *See*—
Morikawa, Akira; Narita, Yoshinori; and Mizutani, Junichi, 4,180,538, Cl. 264-63.000.
Nickl von Nikelsberg, Karl F.: *See*—
Schermer, Gijsbertus J. H.; Winters, Hubertus H. A.; Hildering, Willem C.; and Nickl von Nikelsberg, Karl F., 4,180,828, Cl. 357-79.000.
Nieh, Edward C. Y.: *See*—
Moss, Philip H.; and Nieh, Edward C. Y., 4,180,643, Cl. 528-52.000.
Niggemeier, Joseph F.; and Yeates, Richard P., to ACF Industries, Incorporated. Head insert for railway trailer hitch. 4,179,998, Cl. 410-64.000.
Nii, Katsutoshi: *See*—
Takagi, Nobuho; Maegawa, Muneo; and Nii, Katsutoshi, 4,180,273, Cl. 277-154.000.
Ninomiya, Michikazu: *See*—
Wada, Masahiro; Ueshima, Michio; Yanagisawa, Isao; and Ninomiya, Michikazu, 4,180,678, Cl. 562-534.000.
Nippon Electric Company, Ltd.: *See*—
Takaba, Toshio; and Kobayashi, Toshimasa, 4,179,800, Cl. 29-625.000.
Yamaguchi, Shoshichi; Okasaka, Sadaatsu; and Takayama, Yoshikazu, 4,180,708, Cl. 179-2.0EB.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, 4,179,972, Cl. 84-1.110.
Kosugi, Masao; and Ogata, Takashi, 4,179,794, Cl. 29-580.000.
Suzuki, Hideo, 4,179,968, Cl. 84-1.010.
Takahashi, Toshiyuki; Koike, Masahiko; and Suzuki, Haruyuki, 4,179,971, Cl. 84-1.240.
Nippon Oil Co., Ltd.: *See*—
Imaizumi, Masao; Yasuda, Mitsuo; Sakata, Ko; and Hirano, Noboru, 4,180,688, Cl. 568-899.000.
Nippon Oil Seal Industry Co., Ltd.: *See*—
Nishiyama, Takahiko; and Haga, Kenji, 4,179,883, Cl. 60-293.000.
Nippon Paint Co., Ltd.: *See*—
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,180,417, Cl. 148-6.15Z.
Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See*—
Wada, Masahiro; Ueshima, Michio; Yanagisawa, Isao; and Ninomiya, Michikazu, 4,180,678, Cl. 562-534.000.
Nippon Soken, Inc.: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,180,039, Cl. 123-139.0AW.
Nippon Telegraph & Telephone Public Corporation: *See*—
Komori, Kazuaki; and Kaiyoh, Hirofumi, 4,180,798, Cl. 340-146.30H.

Yamaguchi, Shoshichi; Okasaka, Sadaatsu; and Takayama, Yoshikazu, 4,180,708, Cl. 179-2.0EB.
Nippondenso Co., Ltd.: *See*—
Hobo, Nobuhito; Suzuki, Yutaka; Naito, Takashi; and Konishi, Yoshimune, 4,180,037, Cl. 123-139.00E.
Kawamura, Michio, 4,180,043, Cl. 123-146.50B.
Kobayashi, Akio; Endo, Kunio; and Omori, Norio, 4,180,023, Cl. 123-32.0EA.
Nishikawa, Masaru; Numakura, Toshihiko; and Hirai, Jun, to Sony Corporation. Apparatus and method for reproducing video signals. 4,180,833, Cl. 360-21.000.
Nishimura, Toshio: *See*—
Omi, Tadao; Watanabe, Minoru; and Nishimura, Toshio, 4,180,478, Cl. 252-301.40H.
Nishino, Atsushi; Sonetaka, Kazunori; Kimura, Kunio; and Watanabe, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Self-cleaning catalytic coating. 4,180,482, Cl. 252-455.00R.
Nishino, Hiroshi: *See*—
Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.
Nishiwaki, Koji: *See*—
Yoshihara, Touhachi; Nishiwaki, Koji; and Seki, Kiwao, 4,180,857, Cl. 364-497.000.
Nishiyama, Takahiko; and Haga, Kenji, to Nippon Oil Seal Industry Co., Ltd. Reed valve assembly. 4,179,883, Cl. 60-293.000.
Nissan Chemical Industries Ltd.: *See*—
Yanagimoto, Akira; Kumazawa, Shunichi; and Takakuwa, Yasuo, 4,180,496, Cl. 260-45.8NT.
Nissan Motor Company, Limited: *See*—
Aoyama, Syunichi, 4,180,033, Cl. 123-119.00A.
Endo, Hiroshi; and Fujiki, Norio, 4,180,816, Cl. 343-7.0VM.
Miyazaki, Hiroaki; Sakai, Yasuo; and Matuoka, Tosimitu, 4,180,041, Cl. 123-141.000.
Muranaka, Shigeo; Ochiai, Kokichi; and Waku, Makio, 4,180,031, Cl. 123-117.00A.
Nittan Kohki Co., Ltd.: *See*—
Fujita, Susumu, 4,179,775, Cl. 24-249.00R.
Nixon, Roy A., Jr., to Corning Glass Works. Sealed beam lamp including filament locating means. 4,180,755, Cl. 313-113.000.
Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyester type powder coating composition. 4,180,652, Cl. 525-437.000.
Nogami, Tomoyuki: *See*—
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Fuel injection system for an internal combustion engine. 4,180,039, Cl. 123-139.0AW.
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for shearing hot strips and device therefor. 4,179,958, Cl. 83-37.000.
Nomura, Yoshihisa: *See*—
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.
Norlin Industries, Inc.: *See*—
Moog, Robert A., 4,180,707, Cl. 179-1.00M.
Norris, Curtis; and Scott, Delmer D., to Norris, Curtis. Simulated spoke wheel structure. 4,180,293, Cl. 301-54.000.
North American Philips Corporation: *See*—
Ustin, George; and Soltis, Andrew P., 4,180,305, Cl. 339-198.00H.
Northern Border Pipeline Company: *See*—
Park, Donald M.; and Eiber, Robert J., 4,180,104, Cl. 138-172.000.
Northland Group, Inc., The: *See*—
Diederich, David A., 4,180,413, Cl. 156-185.000.
Northwestern University: *See*—
Patterson, Roy; and McIntire, Floyd C., 4,180,562, Cl. 424-91.000.
Notelteirs, Victor R.; and Rijckaert, Josephus F., to U.S. Philips Corporation. Capless electric incandescent lamp. 4,180,758, Cl. 313-318.000.
Nowak, Manfred: *See*—
Voss, Cay-Peter; and Nowak, Manfred, 4,180,009, Cl. 116-206.000.
Nozaki, Kenzie, to Shell Oil Company. Production of 1,7-octadiene from butadiene. 4,180,694, Cl. 585-511.000.
Nozawa, Shiyozo; Hokari, Saburo; and Yamaga, Shigeru, to Ricoh Company, Ltd. Automatic film winding apparatus for use with cameras. 4,180,315, Cl. 354-170.000.
NPI Corporation: *See*—
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,179,985, Cl. 99-339.000.
Lang-Ree, Nils, 4,179,948, Cl. 74-242.15R.
Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. Cephalosporin derivatives. 4,180,660, Cl. 544-28.000.
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Haviv, Fortuna; Nudelman, Abraham; and Patchornik, Abraham, 4,180,661, Cl. 544-29.000.
Null, Harold R.; and Perry, Eli, to Monsanto Company. Process for hydrogen recovery from ammonia purge gases. 4,180,553, Cl. 423-359.000.
Numakura, Toshihiko: *See*—
Nishikawa, Masaru; Numakura, Toshihiko; and Hirai, Jun, 4,180,833, Cl. 360-21.000.
Nunes, John F., Jr. Turf grooming vehicle with dischargeable receiver. 4,179,770, Cl. 15-360.000.
Nurk, Siegfried, to Sipra Patententwicklungs- und Beteiligunsgesellschaft mbH. Thread storage and supply arrangement for textile machines. 4,180,215, Cl. 242-47.010.
Nyi, Kayson: *See*—
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,180,645, Cl. 528-73.000.
Oatey Co.: *See*—
Hayes, Robert R., 4,179,779, Cl. 29-78.000.
Obermaier, Frank E., to Eaton Corporation. Temperature limiting shower control valve. 4,180,208, Cl. 236-93.00B.
Obermann, George, to Singer Company, The. Variable step size impulse drive. 4,179,945, Cl. 74-122.000.
Ocean Ecology Ltd.: *See*—
Koblanski, John N., 4,179,937, Cl. 73-646.000.
Ochiai, Kokichi: *See*—
Muranaka, Shigeo; Ochiai, Kokichi; and Waku, Makio, 4,180,031, Cl. 123-117.00A.
Ochmann, Rudolf, to U.S. Philips Corporation. Control device, particularly for controlling the emission current of an X-ray tube. 4,180,761, Cl. 315-292.000.
Odone, Giovanni; and Cochard, Roland, to Robert Bosch GmbH. Regenerative method and apparatus to control an elastic reset torque in movable apparatus. 4,180,774, Cl. 324-125.000.
Oertle, Donald H.; and Peterson, Marvin L., to Conoco, Inc. Structural failure detection method. 4,179,940, Cl. 73-808.000.
Ogata, Takashi: *See*—
Kosugi, Masao; and Ogata, Takashi, 4,179,794, Cl. 29-580.000.
Ogawa, Kiyohisa; and Eshima, Seiji, to Wakodo Kabushiki Kaisha. Wet tissue container. 4,180,160, Cl. 206-210.000.
O'Grady, John F.: *See*—
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., 4,180,640, Cl. 526-323.100.
O Hare, Louis R. Solar engine called, bellows solar engine. 4,179,893, Cl. 60-682.000.
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Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,180,631, Cl. 521-164.000.
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Heat resistant photoresist composition and process for preparing the same. 4,180,404, Cl. 430-284.000.
Ohoka, Akihiro: *See*—
Isshiki, Isao; Ohoka, Akihiro; and Sato, Koji, 4,180,800, Cl. 340-146.3SY.
Ohsawa, Mitsuo: *See*—
Koizumi, Akio; Nakazawa, Hiroshi; and Ohsawa, Mitsuo, 4,180,852, Cl. 363-49.000.
Ohshima, Susumu: *See*—
Munekata, Kenichi; Ohta, Takeshi; and Ohshima, Susumu, 4,179,854, Cl. 51-165.770.
Ohta, Takaaki: *See*—
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.
Ohta, Takeshi: *See*—
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Ohyama, Isao: *See*—
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.
Oiwa, Shigeo. Device for withdrawing injection solution. 4,180,071, Cl. 128-218.00N.
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, to Nippon Paint Co., Ltd. Phosphating of metallic substrate. 4,180,417, Cl. 148-6.15Z.
Okada, Takanori: *See*—
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.
Okada, Tooru: *See*—
Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, 4,180,652, Cl. 525-437.000.
Okasaka, Sadaatsu: *See*—
Yamaguchi, Shoshichi; Okasaka, Sadaatsu; and Takayama, Yoshikazu, 4,180,708, Cl. 179-2.0EB.
Oki Electric Industry Co., Ltd.: *See*—
Watanabe, Akinori; and Shinozuka, Katsumasa, 4,180,334, Cl. 400-124.000.
Okubo, Hiroyuki: *See*—
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000.
Okumura, Haruhiko; and Kanaya, Masanori, to Sony Corporation. Magnetic erasing head with gaps utilizing high flux density and high permeability. 4,180,835, Cl. 360-118.000.
Okumura, Takatoshi: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, 4,179,972, Cl. 84-1.110.
Olcott, Eugene L.; and Abrams, Edwin F., to Versar, Inc. High temperature compressible support and gasket material. 4,180,211, Cl. 239-265.430.
Olin Corporation: *See*—
Parikh, Prakash D., 4,180,398, Cl. 75-157.500.
Olney, Nathaniel M.: *See*—
Raasch, Ernest M.; and Olney, Nathaniel M., 4,180,197, Cl. 227-120.000.
Olsson, Robert G.; and Turkdogan, Ethem T., to United States Steel Corporation. Desulfurization of hot reducing gas. 4,180,549, Cl. 423-230.000.

Olympus Optical Company Ltd.: *See*—
Osanai, Akira, 4,180,834, Cl. 360-109.000.
Omi, Tadao; Watanabe, Minoru; and Nishimura, Toshio, to Tokyo Shibaura Electric Co., Ltd. Alkaline earth halide-rare earth fluoride phosphor. 4,180,478, Cl. 252-301.40H.
Omori, Norio: *See*—
Kobayashi, Akio; Endo, Kunio; and Omori, Norio, 4,180,023, Cl. 123-32.0EA.
Omron Tateisi Electronics Co.: *See*—
Kamimura, Shinobu; and Yamamoto, Hideki, 4,180,061, Cl. 128-681.000.
Onishi, Sigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. 2-Cycle engine of an active thermoatmosphere combustion. 4,180,029, Cl. 123-73.00A.
Onishi, Tsutomu: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,179,955, Cl. 81-57.110.
Onizawa, Kouzi: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Ono, Hiroshi: *See*—
Shibata, Toshiyuki; Ono, Hiroshi; and Isoyama, Kenji, 4,180,546, Cl. 423-178.000.
Ontario Research Foundation: *See*—
Glass, Roger W.; and Kuntze, Richard A., 4,180,433, Cl. 162-3.000.
Oosterhouse, Gerard J., to Rowe International, Inc. Random autoplay. 4,180,802, Cl. 340-162.000.
Optical Coating Laboratory, Inc.: *See*—
Diamond, Ronald M.; Ling, Ku S.; and Winterer, Allen G., 4,180,414, Cl. 136-89.0PC.
O'Rourke, Harold T.; and Abbott, Warren G., to Hollis Engineering, Inc. Mass soldering control system. 4,180,199, Cl. 228-102.000.
Orrill, Larry M.; and Regalbuto, John A., to Jet Research Center, Inc. Methods and apparatus for severing reinforced concrete pilings. 4,180,351, Cl. 405-303.000.
Osanai, Akira, to Olympus Optical Company Ltd. Head mounting device for tape recorder. 4,180,834, Cl. 360-109.000.
Osofsky, Raymond C.: *See*—
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.
Osterwalder, Jean-Pierre F. Root ball clamp. 4,179,847, Cl. 47-76.000.
O'Sullivan, Thomas F.; and Pollock, William H., to Lummus Company, The. Process heater. 4,180,019, Cl. 122-235.00N.
Oswald, Hendrikus J.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Mumford, Robin B., 4,180,214, Cl. 242-47.000.
Otey, Flem B., III; and Otey, Yoshiko S. Keyboard arrangement. 4,180,337, Cl. 400-486.000.
Otey, Yoshiko S.: *See*—
Otey, Flem B., III; and Otey, Yoshiko S., 4,180,337, Cl. 400-486.000.
Otis Engineering Corporation: *See*—
Young, Carter R., 4,180,132, Cl. 166-120.000.
Otsuka, Nobuyuki; Hirai, Seiichi; and Sogabe, Motoshige, to Honda Giken Kogyo Kabushiki Kaisha. Slidable type constant velocity universal joint. 4,180,344, Cl. 403-57.000.
Ottosen, Gert O. Wind mills. 4,180,369, Cl. 415-2.000.
Oustin, Georges; and Krumm, Helmut, to Saint-Gobain Industries. Process and apparatus for making multiply sheets. 4,180,426, Cl. 156-104.000.
Outboard Marine Corporation: *See*—
Henrich, Donald A.; and Rose, Edgar, 4,180,368, Cl. 416-146.00R.
Outokumpu Oy: *See*—
Sipila, Heikki J.; and Uusitalo, Seppo J., 4,180,735, Cl. 250-358.00R.
Owens-Illinois, Inc.: *See*—
Crawford, James E.; and Gray, Don N., 4,179,757, Cl. 3-1.000.
Frissora, Joseph R., 4,180,209, Cl. 237-1.00A.
Oxy Metal Industries Corporation: *See*—
Howell, John K., Jr., 4,180,603, Cl. 427-353.000.
Miyazaki, Yasushi; Suzuki, Masanori; and Kaneko, Hideaki, 4,180,406, Cl. 106-14.150.
Ozawa, Akio; Sakamoto, Masaharu; and Ito, Hideo, to Pioneer Electronic Corporation. Transistor switching circuit with shortened response time. 4,180,750, Cl. 307-362.000.
Pace Photographic Products, Inc.: *See*—
Breslau, Steven M., 4,180,192, Cl. 224-235.000.
Palafox, Jose L. Vehicular burglar alarm system. 4,180,796, Cl. 340-64.000.
Palm, John W.: *See*—
Goddin, Clifton S., Jr.; and Palm, John W., 4,180,554, Cl. 423-574.00R.
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., to Harris Corporation. Apparatus for determining image areas for printing with calibration. 4,180,741, Cl. 250-559.000.
Palmer, George W.: *See*—
Herpich, William A.; and Palmer, George W., 4,180,365, Cl. 414-525.000.
Parca Norrahammar AB: *See*—
Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, 4,180,018, Cl. 122-225.00R.
Parikh, Prakash D., to Olin Corporation. Modification of leaded brasses to improve hot workability. 4,180,398, Cl. 75-157.500.
Park, Donald M.; and Eiber, Robert J., to Northern Border Pipeline Company. Out of contact highly geometrical crack arrestor. 4,180,104, Cl. 138-172.000.
Parkin, Sidney J., to Ever Ready Company (Great Britain) Limited, The. Pedal cycle headlamp. 4,180,849, Cl. 362-72.000.
Partee Products: *See*—
White, Wesley C., 4,179,973, Cl. 84-402.000.
Pascard, Roger: *See*—
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.
Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Throttling device for fluids. 4,180,235, Cl. 251-8.000.
Patchornik, Abraham: *See*—
Haviv, Fortuna; Nudelman, Abraham; and Patchornik, Abraham, 4,180,661, Cl. 544-29.000.
Nudelman, Abraham; and Patchornik, Abraham, 4,180,660, Cl. 544-28.000.
Patel, Rashmikant. Fireplace energy retriever. 4,180,053, Cl. 126-132.000.
Patterson, Roy; and McIntire, Floyd C., to Northwestern University; and Abbott Laboratories. Glutaraldehyde polymerized ragweed antigen E preparation for treatment of allergic patients sensitive to ragweed pollen. 4,180,562, Cl. 424-91.000.
Patthey, Michel, to Edouard Dubied & Cie. (Societe Anonyme). Knitting method and apparatus. 4,179,906, Cl. 66-128.000.
Pauchard, Jean-Paul: *See*—
Siegrist, Adolf E.; Pauchard, Jean-Paul; and De Sousa, Bernardo, 4,180,479, Cl. 252-301.240.
Paul, Donald G., to Envirochem Inc. Isolation and concentration of sample prior to analysis thereof. 4,180,389, Cl. 55-28.000.
Paul Mueller Company: *See*—
Mueller, Paul; and Prine, Ray A., 4,179,902, Cl. 62-238.000.
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, to Stahlwerke Peine-Salzgitter A.G. Method of making a steel wire adapted for cold drawing. 4,180,418, Cl. 148-12.400.
Pauze, Denis R.; and Pucci, Donald G., to General Electric Company. Hydantoin-polyester coating compositions. 4,180,612, Cl. 528-289.000.
Pazos, Jose F.: *See*—
Nacci, George R.; and Pazos, Jose F., 4,180,403, Cl. 430-281.000.
Peabody, Frederick H., Jr., to General Signal Corporation. Preparing insulated wire for cutting and stripping. 4,179,903, Cl. 62-322.000.
Peabody International Corporation: *See*—
Herpich, William A.; and Palmer, George W., 4,180,365, Cl. 414-525.000.
Peck, Richard O., to Coors Container Company. Powder spray apparatus and method for coating interior surface of containers. 4,180,844, Cl. 361-226.000.
Pecoraro, Ralph R.: *See*—
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., 4,180,125, Cl. 165-48.000.
Pellaton, Roy C. Pasta noodle packaging apparatus and method. 4,179,865, Cl. 53-435.000.
Pennwalt Corporation: *See*—
Mageli, Orville L.; and Swarts, William A., 4,180,518, Cl. 260-453.0RZ.
Sandler, Stanley R., 4,180,495, Cl. 260-45.75K.
Penzek, Hans-Jurgen: *See*—
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Pepenko, Vladimir D.: *See*—
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, to Ciba-Geigy Corporation. Process for improving the color yield and fastness properties of dyeings produced with anionic dyes on cellulose fibre material and cationic fibre-reactive compounds. 4,180,664, Cl. 544-194.000.
Perry, Eli: *See*—
Null, Harold R.; and Perry, Eli, 4,180,553, Cl. 423-359.000.
Perry Equipment Co.: *See*—
Perry, Marney D., Jr.; and Graff, Robert A., 4,180,391, Cl. 55-324.000.
Perry, Marney D., Jr.; and Graff, Robert A., to Perry Equipment Co. Gas particulate separator with scavenging gas separation device. 4,180,391, Cl. 55-324.000.
Persson, Erik A., to Sandvik Aktiebolag. Rock milling cutter tongue and slot connected. 4,180,292, Cl. 299-92.000.
Persson, Staffan B.; and Buhler, Rato, to American Optical Corporation. Alignment system and ophthalmic instrument incorporating the same. 4,180,323, Cl. 356-3.000.
Peters, Cornelis: *See*—
Hasker, Jan; and Peters, Cornelis, 4,179,777, Cl. 29-25.130.
Peterson, John A.: *See*—
Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., 4,180,424, Cl. 149-19.400.
Peterson, Marvin L.: *See*—
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Peterson, Wesley R.; and Jaffe, Wolfgang, to Singer Company, The. Electromagnetic bobbin thread supply alarm. 4,180,007, Cl. 112-278.000.
Petrolite Corporation: *See*—
Bienvenu, Joseph O.; and Jagtap, Ashvinkumar N., 4,180,408, Cl. 106-31.000.

Petrosian, Robert A.: *See—*
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.
Petrucci, Pasquale M.: *See—*
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Pettis, Charles D.: *See—*
Cosgrove, John D.; Pettis, Charles D.; and Mullett, Charles E., 4,180,709, Cl. 179-2.0AM.
Pettit, John W., to International Business Machines Corporation. Detection circuit for a bi-directional, self-imaging grating detector. 4,180,704, Cl. 250-237.00G.
Pfarr, Walter L., Jr., to Anchor Post Products, Inc. Chain link fabric attaching system. 4,180,247, Cl. 256-54.000.
Pfeifer, Stanley: *See—*
Hanley, John P.; Petrucci, Pasquale M.; and Pfeifer, Stanley, 4,180,091, Cl. 137-238.000.
Pfieffer, Gerald R.: *See—*
Leavitt, David R.; and Pfieffer, Gerald R., 4,180,167, Cl. 206-622.000.
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, to Hoffmann-La Roche Inc. Thiazine derivatives. 4,180,662, Cl. 544-48.000.
Pfitzenmaier, Gerhard, to Siemens Aktiengesellschaft. Filter for very short electromagnetic waves. 4,180,787, Cl. 333-212.000.
Pfizer Inc.: *See—*
Crawford, Thomas C., 4,180,511, Cl. 260-343.700.
Sciavolino, Frank C., 4,180,654, Cl. 536-9.000.
Pharmachem Corporation: *See—*
Herb, John R., 4,180,567, Cl. 424-180.000.
Phelps, Donald R.: *See—*
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.
Phillips, David C.; Hickam, William M.; and Smith, James D. B., to Westinghouse Electric Corp. Multiple signal thermoparticulating coating. 4,179,926, Cl. 73-339.00R.
Phillips, John F., Jr.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,180,545, Cl. 423-8.000.
Phillips Petroleum Company: *See—*
Chapman, Charles C., 4,180,526, Cl. 585-719.000.
Dixon, Rolland E., 4,180,123, Cl. 165-1.000.
Doss, Richard C., 4,180,514, Cl. 428-417.000.
Fahey, Darryl R.; and Mahan, John E., 4,180,525, Cl. 585-523.000.
Gaines, Larry D.; and Giles, Richard F., 4,180,858, Cl. 364-502.000.
Reusser, Robert E.; and Hughes, William B., 4,180,524, Cl. 585-644.000.
Schirmer, Robert M., 4,179,880, Cl. 60-39.230.
Stapp, Paul R., 4,180,676, Cl. 560-246.000.
Photis, James M., to Stauffer Chemical Company. Process for preparing butyl-p-benzoylbenzoates. 4,180,674, Cl. 560-52.000.
Piaggio & C. S.p.A.: *See—*
Doveri, Carlo, 4,180,280, Cl. 280-277.000.
Pierce, Donald C.: *See—*
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Pigerol, Charles: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.
Piget, Maurice. Four branch spring steel jam fastener clip for assembly of open extrusions. 4,180,347, Cl. 403-405.000.
Pioneer Electronic Corporation: *See—*
Ozawa, Akio; Sakamoto, Masaharu; and Ito, Hideo, 4,180,750, Cl. 307-362.000.
Pires, H. George, to Crosspoint Latch Corp. Television signal phase matching apparatus and method. 4,180,829, Cl. 358-10.000.
Pischke, Reiner: *See—*
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.
Pistoresi, Denis J.: *See—*
Nelson, Donald J.; Pistoresi, Denis J.; and Weisbach, Michael F., 4,180,784, Cl. 331-94.5PE.
Pitney Bowes Inc.: *See—*
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,180,856, Cl. 364-466.000.
Pizzolato, Giacomo: *See—*
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.
Plastic Forming Company, Inc., The: *See—*
Schurman, Peter T., 4,180,540, Cl. 264-156.000.
Platt Saco Lowell Limited: *See—*
Savageau, Richard J., 4,179,773, Cl. 19-159.00A.
Plegat, Alain E., to Societe Anonyme des Usines Chausson. Device for the regulation of the temperature of a supercharged diesel engine. 4,180,032, Cl. 123-119.0CD.
Plichta, Zdenek: *See—*
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Poclain: *See—*
Yeou, Victor, 4,179,981, Cl. 91-33.000.
Poglitsch, Reinhold: *See—*
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Polad, Michael D.: *See—*
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Polaroid Corporation: *See—*
Chiang, Yunn H., 4,180,513, Cl. 260-392.000.
Poletto, John F.: *See—*
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,180,587, Cl. 424-315.000.
Pollock, William H.: *See—*
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Polyakovskaya, Valentina I.: *See—*
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.
Polzin, James J.: *See—*
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Poponiak, Michael R.: *See—*
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., 4,180,439, Cl. 204-1.00T.
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G. Device for handling flaskless moulds. 4,180,156, Cl. 198-726.000.
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, to Trustul Petrolului Bolintin. Process for desalting and dehydration of crude oil including hot water washing and gas stripping. 4,180,457, Cl. 208-188.000.
Porter, Samuel, Jr.: *See—*
Makhlouf, Joseph M.; and Porter, Samuel, Jr., 4,180,619, Cl. 526-202.000.
PPG Industries, Inc.: *See—*
Makhlouf, Joseph M.; and Porter, Samuel, Jr., 4,180,619, Cl. 526-202.000.
Pratt, Rex. 6β-Bromo penicillanic acid. 4,180,506, Cl. 260-245.200.
Praxl, Werner; and Ehret, Reiner, to Dr. Werner Freyberg. Method for detoxifying phosphide containing pesticides. 4,180,557, Cl. 424-10.000.
Premus, Jerry C.: *See—*
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., 4,180,440, Cl. 204-1.00T.
Prescott, Gerald F.: *See—*
Lewis, Charles T., Jr.; and Prescott, Gerald F., 4,180,696, Cl. 585-717.000.
Prewitt, Richard H.: *See—*
Prewitt, Richard H., Jr.; and Prewitt, Richard H., 4,180,821, Cl. 346-7.000.
Prewitt, Richard H., Jr.; and Prewitt, Richard H. Motion tape recorder. 4,180,821, Cl. 346-7.000.
Price, Larry V., to Robertshaw Controls Company. Gage construction and casing body therefor. 4,179,933, Cl. 73-431.000.
Price, Raymond M.: *See—*
Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., 4,180,424, Cl. 149-19.400.
Price, Ronald, to Goodwood Data Systems Ltd. Diesel fuel pipe transducer. 4,179,939, Cl. 73-730.000.
Prikryl, Jaroslav: *See—*
Fritschi, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, 4,180,578, Cl. 424-251.000.
Primbsch, Erik, to Krautkramer-Branson, Inc. Method and apparatus for measuring deformation of a workpiece surface responsive to ultrasonic energy. 4,180,324, Cl. 356-35.500.
Primex Plastics Co.: *See—*
Bertsch, Paul J., 4,180,427, Cl. 156-272.000.
Prine, Ray A.: *See—*
Mueller, Paul; and Prine, Ray A., 4,179,902, Cl. 62-238.000.
Printronix, Inc.: *See—*
Matula, Jerry, 4,180,766, Cl. 318-128.000.
Procter & Gamble Company, The: *See—*
Llenado, Ramon A., 4,180,485, Cl. 252-532.000.
Mitchell, Sharon J.; and Wise, Rodney M., 4,180,472, Cl. 252-162.000.
Produits Chimiques Auxiliaires et de Synthese, P.C.A.S.: *See—*
Le Guen, Yves; and Thiault, Georges, 4,180,510, Cl. 549-79.000.
Pryor, Bodie C., to Gulf Oil Corporation. Method for controlling emissions of ethylene to the atmosphere. 4,179,819, Cl. 34-12.000.
Przirembel, Hans R.: *See—*
Moore, William A.; and Przirembel, Hans R., 4,180,373, Cl. 416-97.00R.
Pucci, Donald G.: *See—*
Pauze, Denis R.; and Pucci, Donald G., 4,180,612, Cl. 528-289.000.
Pullman Incorporated: *See—*
Benko, John M., 4,180,248, Cl. 266-67.000.
Gutridge, Jack E.; and Marsh, Ronald W., 4,179,996, Cl. 105-345.000.
McNally, George S., 4,180,001, Cl. 105-420.000.
Snyder, Richard C., 4,180,000, Cl. 105-409.000.
Snyder, Richard C.; and Bodinger, Donald C., 4,180,228, Cl. 248-74.00R.
Pusch, Gunter: *See—*
Duhrkoop, Jens; and Pusch, Gunter, 4,180,306, Cl. 350-6.400.
Putter, Rolf: *See—*
Behre, Horst; Putter, Rolf; and Steffan, Guido, 4,180,521, Cl. 260-505.00C.

Pyasetskaya, Olga V.: *See—*
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., 4,180,402, Cl. 430-394.000.
Pye (Electronic Products) Limited: *See—*
Derlien, Michael L., 4,180,067, Cl. 128-214.00F.
Pyro Dynamics, Ltd.: *See—*
Wachter, Bernard, 4,180,082, Cl. 131-26.000.
Quarderer, George J.: *See—*
Moll, Norman G.; and Quarderer, George J., 4,180,456, Cl. 208-177.000.
Quinn, David R., to AFA Corporation, The. Child-resistant closure. 4,180,174, Cl. 215-221.000.
R. A. Pearson Company: *See—*
Graham, Robert H.; and McBride, Jerald R., 4,179,866, Cl. 53-468.000.
Raasch, Ernest M.; and Olney, Nathaniel M., to Swingline, Inc. Stapling and marking device. 4,180,197, Cl. 227-120.000.
Rabek, Jan W.: *See—*
Sheldon, Robert S.; and Rabek, Jan W., 4,179,917, Cl. 73-17.00A.
Sheldon, Robert S.; and Rabek, Jan W., 4,180,240, Cl. 251-127.000.
Radencic, Frank J. Method for making lithographic printing plates. 4,179,990, Cl. 101-467.000.
Rainville Company Inc.: *See—*
Rainville, Dewey, 4,180,379, Cl. 425-526.000.
Rainville, Dewey, to Rainville Company Inc. Blow molding machine with rotating core rods. 4,180,379, Cl. 425-526.000.
Raiteri, Angelo, to UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta, S.p.A.; and Doria, Andrea. Bag feeding apparatus for powder material packaging. 4,179,868, Cl. 53-571.000.
Ram Industries, Inc.: *See—*
Grover, Ross D., 4,180,107, Cl. 144-2.00N.
Ramnarace, Jawaharlal; and Wood, William A., to United States of America, Army. Primer-igniter for gun propellants. 4,179,992, Cl. 102-45.000.
Rampling, Brian W.: *See—*
Harris, Jeffrey J.; and Rampling, Brian W., 4,180,759, Cl. 313-388.000.
Ranger, Hubert O. Supply apparatus. 4,179,932, Cl. 73-423.00A.
Rankins, Paul; and Howie, Robert K., Jr., to Grigoleit Company, The. Knob. 4,179,771, Cl. 16-121.000.
Rath, Jack. Stamping device for rotating workpieces. 4,179,988, Cl. 101-7.000.
Ratner, Felix A.: *See—*
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.
Raven, David P.: *See—*
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000.
Raychem Corporation: *See—*
Diaz, Stephen H., 4,180,173, Cl. 215-6.000.
Raymond, Russell J.: *See—*
Evani, Syamalarao; and Raymond, Russell J., 4,180,637, Cl. 526-204.000.
Raytheon Company: *See—*
Rosvold, Warren C., 4,180,422, Cl. 148-175.000.
RB Toy Development Co.: *See—*
Kupperman, Sam; and Kupperman, Dennis, 4,179,841, Cl. 46-94.000.
RCA Corporation: *See—*
Chang, Kern K. N., 4,180,760, Cl. 313-422.000.
Hudson, Kenneth C.; and Herzog, Donald G., 4,180,822, Cl. 346-108.000.
Johns, McKinley R., 4,180,820, Cl. 343-798.000.
Kaplan, Leonard A., 4,180,781, Cl. 330-272.000.
Kaplan, Leonard A., 4,180,782, Cl. 330-276.000.
Khalifa, Jacob R., 4,180,783, Cl. 331-2.000.
Roach, William R., 4,180,830, Cl. 358-128.000.
Reale, Salvatore J., to Foster Wheeler Energy Corporation. Lateral stiffener for strut. 4,179,860, Cl. 52-732.000.
Recchuite, Alexander D.: *See—*
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 4,180,466, Cl. 252-48.600.
Redding, James A. Truck sampling system. 4,179,929, Cl. 73-423.00R.
Reddy, Junuthula N., to Bendix Corporation, The. Pulse smoothing circuit for an electronic fuel control system. 4,180,020, Cl. 123-32.0EA.
Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., to United States of America, Army. Control of burning rate and burning rate exponent by particle size in gun propellants. 4,180,424, Cl. 149-19.400.
Reedy, Charles E., to ACF Industries, Incorporated. Bottom operable tank car lading valve with minimum skid protection for retrofit. 4,180,242, Cl. 251-144.000.
Refojo, Miguel F.: *See—*
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,180,308, Cl. 351-160.00H.
Regalbuto, John A.: *See—*
Orrill, Larry M.; and Regalbuto, John A., 4,180,351, Cl. 405-303.000.
Regan, Barrie F. Cutting wheel. 4,180,048, Cl. 125-15.000.
Regie Nationale des Usines Renault: *See—*
Lefebvre, Jean H., 4,180,121, Cl. 164-152.000.
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, to Bayer Aktiengesellschaft. Hygroscopic fibers and filaments. 4,180,617, Cl. 428-398.000.
Reinhart, Leonard R.: *See—*
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
Renaudat, Jean-Louis: *See—*
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,180,705, Cl. 178-69.100.
Renault, Philippe: *See—*
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 4,180,550, Cl. 423-242.000.
Reneau, Bobby J. Articulated ball connector for use with pipeline. 4,180,285, Cl. 285-261.000.
Reusser, Robert E.; and Hughes, William B., to Phillips Petroleum Company. Disproportionation/double-bond isomerization of olefins. 4,180,524, Cl. 585-644.000.
Revas, Inc.: *See—*
Cutler, Alan B., 4,180,534, Cl. 261-41.00B.
Reynaldo Calderon: *See—*
Calderon, Reynaldo, 4,180,463, Cl. 210-415.000.
Reynolds, Mark P.: *See—*
Ladin, Eli M.; and Reynolds, Mark P., 4,179,780, Cl. 29-149.50R.
Reynolds Metals Company: *See—*
Darrow, George R., 4,180,443, Cl. 204-35.00N.
Rhoades, Richard G., to United States of America, Army. Method of bonding propellants containing mobile constitutents. 4,180,535, Cl. 264-3.00R.
Rhodes, Lloyd E. Scrag saw mill dogging system. 4,179,963, Cl. 83-409.000.
Rhone-Poulenc Industries: *See—*
Bargain, Michel; and Lefort, Marcel, 4,180,515, Cl. 260-448.20Q.
Neel, Jean; and Violland, Robert, 4,180,519, Cl. 260-459.00A.
Rice, James F.: *See—*
Chicoye, Etzer; Helbert, J. Raymond; and Rice, James F., 4,180,589, Cl. 426-11.000.
Rice, Richard E., to Comstock & Wescott, Inc. Catalytic fuel combustion apparatus and method. 4,180,384, Cl. 44-52.000.
Rich, Richard D.: *See—*
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., 4,180,640, Cl. 526-323.100.
Richardson, Donald M., deceased: *See—*
Bamberger, Carlos E.; and Richardson, Donald M., deceased, 4,180,555, Cl. 423-657.000.
Richardson, Elizabeth B., executrix: *See—*
Bamberger, Carlos E.; and Richardson, Donald M., deceased, 4,180,555, Cl. 423-657.000.
Richardson-Merrell Inc.: *See—*
Carr, Albert A.; and Kinsolving, C. Richard, 4,180,583, Cl. 424-267.000.
Huber, Harold E., 4,180,559, Cl. 424-35.000.
Richdel, Inc.: *See—*
Saarem, Myrl J.; and Soukup, Dale F., 4,180,236, Cl. 251-30.000.
Richman, Jay L., to Bendix Corporation, The. Portable multiplex bus exerciser. 4,180,865, Cl. 365-63.000.
Richter Gedeon Vegyeszet, Gyar RT: *See—*
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.
Richter, Paul A. Fluid operated device. 4,180,028, Cl. 123-45.00A.
Ricoh Company, Ltd.: *See—*
Matsumoto, Fuyuhiko; and Inokuchi, Toshiyuki, 4,180,318, Cl. 355-11.000.
Nozawa, Shiyozo; Hokari, Saburo; and Yamaga, Shigeru, 4,180,315, Cl. 354-170.000.
Watanabe, Tsutomu; Yanagawa, Nobuyuki; and Hosaka, Masao, 4,180,721, Cl. 219-216.000.
Yamada, Kunihiro, 4,180,335, Cl. 400-320.000.
Ridder, Gerhard; and Schafer, Wilhelm, to Mannesmann Aktiengesellschaft. Hydraulic control with delay. 4,179,887, Cl. 60-420.000.
Rijckaert, Josephus F.: *See—*
Notelteirs, Victor R.; and Rijckaert, Josephus F., 4,180,758, Cl. 313-318.000.
Riley, Jesse L.: *See—*
Howell, Carl J., Jr.; Trott, David W.; and Riley, Jesse L., 4,180,536, Cl. 264-53.000.
Riley, Michael W.: *See—*
Gunderman, Robert J.; Alcock, Keith; Skinner, Charles S.; and Riley, Michael W., 4,180,177, Cl. 220-88.00A.
Riley, Robert E.; and Wallace Sr., Terry C., to United States of America, Energy. Method for making hot-pressed fiber-reinforced carbide-graphite composite. 4,180,428, Cl. 156-281.000.
Risberg, Robert L., to Cutler-Hammer, Inc. Closed-loop regulating and overhauling load energy dissipating chopper type current control system for D.C. Motors. 4,180,767, Cl. 318-308.000.
Ritt, Donald: *See—*
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.
Roach, William R., to RCA Corporation. Depth estimation system using diffractive effects of the grooves and signal elements in the grooves. 4,180,830, Cl. 358-128.000.
Robert Bosch GmbH: *See—*
Hertfelder, Wilhelm, 4,180,234, Cl. 251-14.000.
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.
Odone, Giovanni; and Cochard, Roland, 4,180,774, Cl. 324-125.000.
Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, 4,180,026, Cl. 123-32.0EF.

Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.
Steinbrenner, Ulrich; Kirn, Dieter; and Schnurle, Hans, 4,180,025, Cl. 123-32.0EA.
Weiler, Paul; and Brummer, Dietmar, 4,179,766, Cl. 15-250.320.
Weiler, Paul; and Brummer, Dietmar, 4,179,767, Cl. 15-250.320.
Wesemeyer, Jurgen; and Haubner, Georg, 4,180,803, Cl. 340-164.00R.

Robertshaw Controls Company: *See*—
Price, Larry V., 4,179,933, Cl. 73-431.000.
Williamson, Warren G., 4,179,928, Cl. 73-368.300.

Robinson, Mark L., to Acro, Inc. Racket handle and method of making same. 4,180,264, Cl. 273-73.00J.

Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, to Hoechst Aktiengesellschaft. Triazolidino-pyridazine-diones. 4,180,575, Cl. 424-250.000.

Rockwell International Corporation: *See*—
Eshghy, Siavash, 4,179,786, Cl. 29-407.000.

Rohm and Haas Company: *See*—
Emmons, William D., 4,180,598, Cl. 427-44.000.
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,180,645, Cl. 528-73.000.
Fromuth, Harry C.; and Shell, Kenneth M., 4,180,494, Cl. 260-40.00R.
Ilenda, Casmir S., 4,180,632, Cl. 521-184.000.
Kim, Samuel S.; and Stevens, Travis E., 4,180,491, Cl. 260-29.2TN.

Romero, Frank; and Gardiner-Romero, Joanne L. Tray for increasing wax impregnated log burning life. 4,180,054, Cl. 126-164.000.

Romero, Victor R., to Eagle Picher Industries, Inc. Movable storage and/or display apparatus. 4,180,277, Cl. 280-79.300.

Rose, Edgar: *See*—
Henrich, Donald A.; and Rose, Edgar, 4,180,368, Cl. 416-146.00R.

Rosenitsch, Johann, to Hubner-Vamag Aktiengesellschaft & Co. Kommanditgesellschaft. Stopcock formed of sheet metal. 4,180,244, Cl. 251-309.000.

Rosenkranz, Hans J.: *See*—
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.

Ross, Roger J., to Singer Company, The. Tension selecting mechanism for sewing machines. 4,180,006, Cl. 112-254.000.

Rosvold, Warren C., to Raytheon Company. Method of making semiconductor diodes. 4,180,422, Cl. 148-175.000.

Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, to Vapor Corporation. Lift assembly for transit vehicles. 4,180,366, Cl. 414-540.000.

Rothfuss, Robert G.: *See*—
Hueil, J. Charles; Rothfuss, Robert G.; and Boothby, Terry A., 4,180,196, Cl. 227-109.000.

Routens, Jean-Paul. Saddle support for bicycles and the like. 4,180,345, Cl. 403-84.000.

Rowe International, Inc.: *See*—
Oosterhouse, Gerard J., 4,180,802, Cl. 340-162.000.

Rowe, Neal E.: *See*—
Shariff, Sadiq A.; Bharteey, Brij M.; and Rowe, Neal E., 4,180,845, Cl. 361-334.000.

Rowse, Dan D., to Rowse Hydraulic Rakes Company, Inc. Trailing tandem mower. 4,179,870, Cl. 56-6.000.

Rowse Hydraulic Rakes Company, Inc.: *See*—
Rowse, Dan D., 4,179,870, Cl. 56-6.000.

Roy, William D.: *See*—
Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., 4,179,881, Cl. 60-39.710.

Rozenoer, Alexandr S.: *See*—
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.

Rudolph, Hans: *See*—
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.

Rudolph, Paul, to Metallgesellschaft Aktiengesellschaft. Process for removing slag during pressure gasification of solid fuels. 4,180,387, Cl. 48-206.000.

Rumbaugh, Paul S., to Altec Corporation. Input decoupling circuit for transistor differential amplifier. 4,180,780, Cl. 330-252.000.

Runnells, Robert R.; and Schmoegner, John C., to MDT Instrument Company. Dental instrument delivery system. 4,179,813, Cl. 433-79.000.

Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning apparatus and method. 4,180,126, Cl. 165-59.000.

Rydell, Robert A.: *See*—
Steffensen, Leslie M.; Dutell, H. Gary; and Rydell, Robert A., 4,179,820, Cl. 34-92.000.

Ryle, Dallas M., Jr., to Lockheed Corporation. Aerial dispersal system. 4,180,224, Cl. 244-136.000.

Ryvkin, Moisei I.: *See*—
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.

S.F.Z. Souplesse Fonctionnelle Systematique: *See*—
Mazier, Paul, 4,179,910, Cl. 72-59.000.

Saarem, Myrl J.; and Soukup, Dale F., to Richdel, Inc. Normally-open valve assembly with solenoid-operated pilot. 4,180,236, Cl. 251-30.000.

Saaski, Elric W., to Electric Power Research Institute, Inc. Temperature sensing device. 4,179,927, Cl. 73-350.000.

Sabir-de-Ribas, Konstantin I.: *See*—
Shumyakin, Evgeny P.; Sabir-de-Ribas, Konstantin I.; Druzhinsky, Isaak A.; Shishov, Gennady P.; and Andreichikov, Boris I., 4,180,435, Cl. 176-30.000.

Sachse, Burkhard: *See*—
Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, 4,180,575, Cl. 424-250.000.

Saeufferer, Helmut: *See*—
Buchner, Helmut; and Saeufferer, Helmut, 4,179,896, Cl. 62-7.000.

Safeway Stores, Incorporated: *See*—
Lonsdale, Alice, 4,180,336, Cl. 400-491.300.

Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, to Wieland-Werke Aktiengesellschaft. Y and T-finned tubes and methods and apparatus for their making. 4,179,911, Cl. 72-78.000.

Saika, Daini: *See*—
Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, 4,180,468, Cl. 252-117.000.

Saiki, Junichi; and Kumai, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an exhaust gas recirculation system. 4,180,035, Cl. 123-119.00A.

St. Clair, Anne K.: *See*—
St. Clair, Terry L.; and St. Clair, Anne K., 4,180,648, Cl. 528-207.000.

St. Clair, Terry L.; and St. Clair, Anne K., to United States of America, National Aeronautics and Space Administration. Crystalline polyimides. 4,180,648, Cl. 528-207.000.

Saint-Gobain Industries: *See*—
Oustin, Georges; and Krumm, Helmut, 4,180,426, Cl. 156-104.000.

Saito, Makoto: *See*—
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, 4,180,399, Cl. 75-229.000.

Saito, Masumi: *See*—
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,180,631, Cl. 521-164.000.

Sakae Riken Kogyo Co., Ltd.: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.

Sakai, Yasuo: *See*—
Miyazaki, Hiroaki; Sakai, Yasuo; and Matuoka, Tosimitu, 4,180,041, Cl. 123-141.000.

Sakamoto, Masaharu: *See*—
Ozawa, Akio; Sakamoto, Masaharu; and Ito, Hideo, 4,180,750, Cl. 307-362.000.

Sakata, Ko: *See*—
Imaizumi, Masao; Yasuda, Mitsuo; Sakata, Ko; and Hirano, Noboru, 4,180,688, Cl. 568-899.000.

Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, to Fiat Societa per Azioni. Device for keeping under control the population of selected species of insects. 4,179,839, Cl. 43-112.000.

Samuels, Michael R.: *See*—
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.

Sanda, Shougo; Nakamura, Noriniko; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Torch ignition type internal combustion engine. 4,180,044, Cl. 123-191.00S.

Sandefur, Herbert G., to Kienzle, Kenneth, Jr.; Jay, Gary; Clifton, John L.; and Womack, Joe B., part interest to each. Hanging insecticide drum. 4,179,840, Cl. 43-131.000.

Sanders Associates, Inc.: *See*—
Hollis, Ernest E., 4,179,801, Cl. 29-626.000.

Sandler, Stanley R., to Pennwalt Corporation. Polyester resins flame retarded by poly(metal phosphinate)s. 4,180,495, Cl. 260-45.75K.

Sandoz, Inc.: *See*—
Houlihan, William J., 4,180,671, Cl. 548-324.000.

Sandoz Ltd.: *See*—
Stadler, Paul, 4,180,581, Cl. 424-261.000.

Sandvik Aktiebolag: *See*—
Persson, Erik A., 4,180,292, Cl. 299-92.000.
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, 4,180,400, Cl. 75-235.000.

Sandy, Charles A.: *See*—
McCormack, William B.; and Sandy, Charles A., 4,180,386, Cl. 44-63.000.

Sanford, Gary G., to Ball Corporation. Serially connected microstrip antenna array. 4,180,817, Cl. 343-700.0MS.

Santiago, Enrique, to Zeuna-Starker GmbH & Co. KG. Catalytic converter having monolith mounting means therein. 4,180,544, Cl. 422-179.000.

Sanyo Electric Co., Ltd.: *See*—
Iwaki, Hiroshi; and Nakamura, Masaaki, 4,180,376, Cl. 417-360.000.

Sanyo Kokusaku Pulp Co Ltd: *See*—
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.

Saotome, Shigeo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for detecting position of hydraulic cylinder. 4,179,982, Cl. 92-5.00R.

Sarantakis, Dimitrios, to American Home Products Corporation. Polypeptides related to somatostatin. 4,180,500, Cl. 260-112.50S.

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Sastri, Suri A.; and Alexander, Ben H., to Gillette Company, The. Razor blades. 4,180,420, Cl. 148-37.000.
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Shiba, Haruo; and Sato, Takateru, 4,180,220, Cl. 242-199.000.
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Takahashi, Yasuyoshi; Sekiguchi, Shigeo; and Sato, Teruyoshi, 4,180,206, Cl. 235-419.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Constant printing pressure mechanism for portable label printing and applying machine, or the like. 4,179,989, Cl. 101-291.000.
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Nagata, Takeo; Satoh, Seisuke; and Matsumoto, Takao, 4,180,626, Cl. 435-144.000.
Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,180,682, Cl. 568-662.000.
Saupe, Martin: *See*—
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000.
Savageau, Richard J., to Platt Saco Lowell Limited. Means for severing and compacting coiled sliver. 4,179,773, Cl. 19-159.00A.
Sawada, Yoshio: *See*—
Kawasaki, Masahiro; and Sawada, Yoshio, 4,180,310, Cl. 354-24.000.
Sawafuji Electric Co. Ltd.: *See*—
Katayama Naohiro, 4,179,899, Cl. 62-228.000.
Sawyer, Roderick, to Aktiebolaget Electrolux. Vacuum dumping arrangement for a wet/dry vacuum cleaner. 4,179,768, Cl. 15-352.000.
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., to Exxon Research & Engineering Co. Process for selective removal of cyclic urea from hindered amine gas treating solution. 4,180,548, Cl. 423-223.000.
Scanmec A/S: *See*—
Langvik, Sigmund C., 4,180,461, Cl. 210-333.00A.
Schadt, Martin; Scherrer, Hanspeter; and Boller, Arthur. Liquid crystal mixtures. 4,180,475, Cl. 252-299.000.
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Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.
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Ridder, Gerhard; and Schafer, Wilhelm, 4,179,887, Cl. 60-420.000.
Schantz, Spencer C. Bimetal actuated locking device. 4,179,907, Cl. 68-12.00R.
Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. Novel prostaglandins. 4,180,677, Cl. 562-500.000.
Schaumburg, Gunter, to Neiman S.A. Steering lock. 4,179,908, Cl. 70-185.000.
Schenck, Jay R.: *See*—
Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., 4,180,556, Cl. 424-1.000.
Schering Aktiengesellschaft: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.
Schering Corporation: *See*—
Mallams, Alan K.; and Davies, David H., 4,180,565, Cl. 424-180.000.
Schermer, Gijsbertus J. H.; Winters, Hubertus H. A.; Hildering, Willem C.; and Nickl von Nikelsberg, Karl F., to U.S. Philips Corporation. Hybrid circuit having a semiconductor circuit. 4,180,828, Cl. 357-79.000.
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Schadt, Martin; Scherrer, Hanspeter; and Boller, Arthur, 4,180,475, Cl. 252-299.000.
Schiavone, Lawrence M., to Bell Telephone Laboratories, Incorporated. Electroless plating of polyvinylidene fluoride. 4,180,602, Cl. 427-306.000.
Schirmer, Robert M., to Phillips Petroleum Company. Comb..stion process and apparatus therefor. 4,179,880, Cl. 60-39.230.
Schlosser, Helmut: *See*—
Alberti, James; and Schlosser, Helmut, 4,180,062, Cl. 128-698.000.
Schlumberger Technology Corporation: *See*—
Lavigne, Jean C.; and Segeral, Gerard, 4,179,817, Cl. 33-129.000.
Schmid, Karlheinz, to Gebrueder Heller Maschinenfabrik GmbH. Machine tool for machining of shafts, especially crankshafts. 4,180,359, Cl. 409-197.000.
Schmid, Rolf; and Kreibich, Ursula, to Ciba-Geigy Corporation. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins. 4,180,527, Cl. 525-115.000.
Schmidt, Ewald; and Wiessner, Willi, to Ernst Leitz Wetzlar GmbH. Photographic camera with through the lens exposure meter. 4,180,312, Cl. 354-59.000.
Schmidt, Hans-Georg, to Dynamit Nobel Aktiengesellschaft. Method of preparing dihalogen vinyl cyclopropanecarboxylic acid esters. 4,180,446, Cl. 204-158.00R.
Schmidt, Klaus: *See*—
Schultheiss, Wolfram; and Schmidt, Klaus, 4,180,611, Cl. 428-288.000.
Schmitt, Manfred: *See*—
Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.
Schmoegner, John C.: *See*—
Runnells, Robert R.; and Schmoegner, John C., 4,179,813, Cl. 433-79.000.
Schnabel, Roland; and Hussmann, Eckart, to JENAer Glaswerk Schott & Gen. Laminar solar energy collecting unit having absorber plates consisting of hollow fibers. 4,180,056, Cl. 126-447.000.
Schneider, Claus: *See*—
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.
Schneider, John T.: *See*—
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., 4,180,440, Cl. 204-1.00T.
Schneider, Norbert: *See*—
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.
Schneider, Steffen: *See*—
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.
Schnurle, Hans: *See*—
Steinbrenner, Ulrich; Kirn, Dieter; and Schnurle, Hans, 4,180,025, Cl. 123-32.0EA.
Scholz, Herbert, to BASF Aktiengesellschaft. Manufacture of N-[3,4-dimethylphenyl]-D-ribamine. 4,180,523, Cl. 260-573.000.
Schramm, Jack B. Dual indicating tachometer apparatus. 4,179,938, Cl. 73-510.000.
Schrodter, Klaus; Kandler, Joachim; and Spott, Hasso, to Hoechst Aktiengesellschaft. Production of blends of crystalline zeolite and sodium triphosphate. 4,180,471, Cl. 252-140.000.
Schroter, Herbert, to Hoechst Aktiengesellschaft. Apparatus for developing sheets of diazotype copying material by the semi-dry process. 4,180,317, Cl. 354-318.000.
Schulein, Rolf G., to Leifheit International Gunter Leifheit GmbH. Suction-attachable kitchen appliance. 4,180,229, Cl. 248-363.000.
Schuller, Ronald A.; and Clarkson, Robert I., to Geosource, Inc. Corrosion coupon holder apparatus. 4,179,920, Cl. 73-86.000.
Schulte, Louis T.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.
Schultenkamper, Josef, to Gelenkwellenbau GmbH. Bearing system in a universal joint. 4,179,905, Cl. 64-17.00A.
Schultheiss, Wolfram; and Schmidt, Klaus, to Carl Freudenberg, Firma. Smooth-surfaced nonwoven fabric. 4,180,611, Cl. 428-288.000.
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., to UOP Inc. Apparatus for selectively heating an individual food item in a refrigerated environment. 4,180,125, Cl. 165-48.000.
Schulze, Kurt, to BASF Aktiengesellschaft. Manufacture of a supported chromium oxide catalyst for olefin polymerization. 4,180,481, Cl. 252-441.000.
Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, to Robert Bosch GmbH. Apparatus for controlling the operating current of electromagnetic devices. 4,180,026, Cl. 123-32.0EF.
Schumann, Erwin; and Bohlander, Oskar, to Deutsche Gold- and Silber-Scheideanstalt Vormals Roessler. Vacuum oven with graphite heating. 4,180,697, Cl. 13-25.000.
Schurman, Peter T., to Plastic Forming Company, Inc., The. Method of making a reinforced bearing aperture in thermoplastic sheet material. 4,180,540, Cl. 264-156.000.
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, to Bayer Aktiengesellschaft. Radiation-hardenable diluents for radiation-hardenable compositions. 4,180,474, Cl. 252-188.30R.
Schwander, Hansrudolf; and Zickendraht, Christian, to Ciba-Geigy Aktiengesellschaft. Substituted 3-benz(cd)indol-2-(1H)-ylidenefuro[2,3-b]quinoxalin-2(3H)one dyestuffs. 4,180,665, Cl. 544-345.000.
Schwartz, Arnold, to United States of America, Navy. Pseudo range and range rate device. 4,180,205, Cl. 235-411.000.
Schwartz, Leonard; Chin, Edward; and Deveau, Emile J., to Singer Company, The. Doppler navigation microstrip slanted antenna. 4,180,818, Cl. 343-700.0MS.
Schwartz, Sidney J., to Burroughs Corporation. Bubble memory coil drive circuit. 4,180,864, Cl. 365-6.000.
Schwarz, Manfred: *See*—
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.
Schweizerische Isola-Werke: *See*—
Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, 4,180,434, Cl. 162-138.000.
Schwenker, Robert O.: *See*—
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., 4,180,439, Cl. 204-1.00T.
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, to Robert Bosch GmbH. Hydraulic apparatus for the automatic correction of the inclination of the headlights of a motor vehicle. 4,180,848, Cl. 362-71.000.
Sciavolino, Frank C., to Pfizer Inc. 4"-Deoxy-4"-acylamido derivatives of oleandomycin, erythromycin and erythromycin carbonate. 4,180,654, Cl. 536-9.000.
Sciulli, Francis J.: *See*—
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
Scorso, Clifford A., Jr.; and Messer, Gordon J., to United Technologies Corporation. Two-stage commutation circuit for an inverter. 4,180,853, Cl. 363-96.000.

Scott, Delmer D.: *See—*
Norris, Curtis; and Scott, Delmer D., 4,180,293, Cl. 301-54.000.
Scott & Fetzer Company, The: *See—*
Gretz, Thomas J., 4,180,227, Cl. 248-56.000.
Scudder, Roy, to Day, Edward. Harvesters for harvesting berries. 4,179,873, Cl. 56-330.000.
Sefcik, Robert. Load bearing pendant system. 4,180,152, Cl. 198-377.000.
Segeral, Gerard: *See—*
Lavigne, Jean C.; and Segeral, Gerard, 4,179,817, Cl. 33-129.000.
Seiler, Herbert: *See—*
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
Seipp, William H., to Gulf & Western Industries, Inc. Programmable controller using microprocessor. 4,180,862, Cl. 364-900.000.
Seki, Kiwao: *See—*
Yoshihara, Touhachi; Nishiwaki, Koji; and Seki, Kiwao, 4,180,857, Cl. 364-497.000.
Sekiguchi, Shigeo: *See—*
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Selbeck, Harald; Dhein, Rolf; and Cohnen, Wolfgang, to Bayer Aktiengesellschaft. Coating compositions for polycarbonates. 4,180,493, Cl. 260-32.80N.
Sempliner, Arthur T.: *See—*
Teague, Walter D., Jr.; and Sempliner, Arthur T., 4,179,765, Cl. 15-22.00R.
Sen, Soumendra N.: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,180,425, Cl. 149-95.000.
Sencar, Drago, to Lonza Ltd. Process for the production of hard plastic foams using a polyvinylchloride base. 4,180,447, Cl. 204-159.170.
Senco Products, Inc.: *See—*
Hueil, J. Charles; Rothfuss, Robert G.; and Boothby, Terry A., 4,180,196, Cl. 227-109.000.
Senkbeil, Herman O.: *See—*
Johnston, Howard; and Senkbeil, Herman O., 4,180,395, Cl. 71-94.000.
Sevastakis, Gus. Composite pinch roll for continuous vertical casting. 4,180,122, Cl. 164-448.000.
Sevillano, Richard; and Bruno, Rocco, Jr. Emergency escape openable skylight. 4,180,142, Cl. 182-77.000.
Sewing, Wilhelm. Apparatus for damping noise in bar-feeding devices of screw-cutting machines. 4,179,957, Cl. 82-38.00A.
Shahan, James E., to Allis-Chalmers Corporation. Vibratory screen having noise level reduction by isolation. 4,180,458, Cl. 209-326.000.
Shalit, Harold: *See—*
Leonard, John J.; and Shalit, Harold, 4,180,681, Cl. 562-600.000.
Shanks, Roy R., to Burroughs Corporation. Single transistor memory cell employing an amorphous semiconductor threshold device. 4,180,866, Cl. 365-186.000.
Shappir, Joseph, to Intel Corporation. MOS double polysilicon read-only memory and cell. 4,180,826, Cl. 357-41.000.
Shariff, Sadiq A.; Bharteey, Brij M.; and Rowe, Neal E., to Westinghouse Electric Corp. Control center with bus bar insulators. 4,180,845, Cl. 361-334.000.
Shaver, J. Lyle, to Allis-Chalmers Corporation. Distribution augers for an axial flow combine. 4,180,081, Cl. 130-27.00R.
Shea, Dennis W., to Dana Corporation. Vehicle having auxiliary drive mechanism. 4,180,138, Cl. 180-65.00A.
Shearer, Harry D.: *See—*
Councilman, Clyde L.; and Shearer, Harry D., 4,180,724, Cl. 235-92.00T.
Sheldon, Robert S.; and Rabek, Jan W., to Air-Dry Corporation of America. Low pressure dew and frost point indicator. 4,179,917, Cl. 73-17.00A.
Sheldon, Robert S.; and Rabek, Jan W., to Air-Dry Corporation of America. Low noise level control valve. 4,180,240, Cl. 251-127.000.
Shell, Kenneth M.: *See—*
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Shell Oil Company: *See—*
Carr, John B., 4,180,572, Cl. 424-248.550.
McClure, James D., 4,180,695, Cl. 585-730.000.
Nozaki, Kenzie, 4,180,694, Cl. 585-511.000.
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,180,520, Cl. 260-465.00R.
Sherif, Fawzy G.; and Irani, Mazin R., to Stauffer Chemical Company. Phosphorus-nitrogen-silica composition as a flame retardant. 4,180,630, Cl. 521-106.000.
Sherwin-Williams Company, The: *See—*
Halicki, Frank E., 4,180,011, Cl. 118-685.000.
Sherwood Medical Industries Inc.: *See—*
Murty, Vabilisetti S., 4,180,465, Cl. 210-516.000.
Shiao, Monley M. Y.; and Spector, George. Voltage phase testing and indicating device. 4,180,773, Cl. 324-86.000.
Shiba, Haruo; and Sato, Takateru, to TDK Electronics Co., Ltd. Tape cassette. 4,180,220, Cl. 242-199.000.
Shibasaki, Ichiro: *See—*
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,180,404, Cl. 430-284.000.
Shibata, Toshiyuki; Ono, Hiroshi; and Isoyama, Kenji, to Central Glass Company, Limited. Process for removing phosphorus from phosphorus-containing fluorite. 4,180,546, Cl. 423-178.000.
Shibata, Tsutomu: *See—*
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Shimano Industrial Company, Limited: *See—*
Hanada, Mitsugu; and Fukui, Seiji, 4,179,953, Cl. 74-750.00B.
Shimizu, Hidetoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control valve for vehicle braking systems. 4,180,294, Cl. 303-6.00C.
Shimizu, Kenichi: *See—*
Tamura, Gakuzo; and Shimizu, Kenichi, 4,180,436, Cl. 435-119.000.
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Koyanagi, Shunichi; Shimizu, Toshihide; and Fushimi, Kenji, 4,180,634, Cl. 526-62.000.
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Shimokawa, Ryushi, to Hitachi, Ltd. Digital comparator constructed of IIL. 4,180,797, Cl. 340-146.200.
Shin-Etsu Chemical Company: *See—*
Takago, Toshio, 4,180,642, Cl. 528-32.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Koyanagi, Shunichi; Shimizu, Toshihide; and Fushimi, Kenji, 4,180,634, Cl. 526-62.000.
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Shirahama, Haruhisa: *See—*
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Kazuo, Yamashita; Koji, Kuroyanagi; and Naoki, Matsuo, 4,180,590, Cl. 426-18.000.
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Shook, Robert C.: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
Hirota, Kiwami; Tamano, Hideki; and Inazawa, Shintaro, 4,180,636, Cl. 526-125.000.
Showa Oil Co., Ltd.: *See—*
Nagata, Takeo; Satoh, Seisuke; and Matsumoto, Takao, 4,180,626, Cl. 435-144.000.
Shringarpurey, Sudhir K.: *See—*
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Shurcliff, William A., to Broad Corporation. Process and apparatus for heat exchange. 4,180,124, Cl. 165-1.000.
SI Handling Systems, Inc.: *See—*
Sleep, Craig, 4,179,993, Cl. 104-172.0BT.
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Photo electric light detection devices. 4,180,702, Cl. 250-227.000.
Siegrist, Adolf E.; Pauchard, Jean-Paul; and De Sousa, Bernardo, to Ciba-Geigy Corporation. Stilbene compounds. 4,180,479, Cl. 252-301.240.
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Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
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Gedeon, Andras, 4,180,734, Cl. 250-345.000.
Hoffmann, Kurt, 4,180,806, Cl. 340-347.0AD.
Pfitzenmaier, Gerhard, 4,180,787, Cl. 333-212.000.
Sievers, Paul T. Golf ball retriever. 4,180,288, Cl. 294-19.00A.
Sigma Systems, Inc.: *See—*
Krishnan, Ravi C.; and Blackburn, Charles M., 4,180,153, Cl. 198-425.000.
Sih, John C., to Upjohn Company, The. Acyl-substituted phenyl esters of prostacyclin-type compounds. 4,180,657, Cl. 542-426.000.
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Marsh, David R., 4,179,824, Cl. 35-10.240.
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Peterson, Wesley R.; and Jaffe, Wolfgang, 4,180,007, Cl. 112-278.000.
Ross, Roger J., 4,180,006, Cl. 112-254.000.
Schwartz, Leonard; Chin, Edward; and Deveau, Emile J., 4,180,818, Cl. 343-700.0MS.
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.
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Sinor, Jerry E., to Cameron Engineers, Inc. Method for hydrogenation of coal. 4,180,452, Cl. 208-8.0LE.

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Nurk, Siegfried, 4,180,215, Cl. 242-47.010.

Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, to American Cyanamid Company. Ureylene phenylene anionic naphthalenesulfonic acids as complement inhibitors. 4,180,587, Cl. 424-315.000.

Sizemore, Guy D. Outdoor cooking grill unit with tilting feature. 4,180,050, Cl. 126-25.00A.

Sjoberg, James G., to Chromalloy American Corporation. Mud pump valve. 4,180,097, Cl. 137-516.290.

Skinner, Charles S.: *See*—
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SKW Trostberg Aktiengesellschaft: *See*—
Amann, Fritz, 4,180,393, Cl. 71-78.000.

Slagle, Fred. Exercise device. 4,180,260, Cl. 272-97.000.

Sleep, Craig, to SI Handling Systems, Inc. Material handling vehicle. 4,179,993, Cl. 104-172.0BT.

Sloan, Benjamin J., to Texas Instruments Incorporated. Input buffer for integrated injection logic circuits. 4,180,749, Cl. 307-299.00B

Smilgys, Bruno S., to Veeder Industries, Inc. Presettable counter mechanism. 4,180,202, Cl. 235-132.00R.

Smirnov, Alexandr S.: *See*—
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Smith, Harvell M., to Johns-Manville Corporation. Cutting guide tool for fabrication of air duct transitions and method of its use. 4,179,808, Cl. 30-293.000.

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Phillips, David C.; Hickam, William M.; and Smith, James D. B., 4,179,926, Cl. 73-339.00R.

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Goldstein, Norman P.; and Smith, Richard C., 4,180,728, Cl. 250-264.000.

Smith, Thomas M. Animal behavioral control device. 4,180,013, Cl. 119-29.000.

Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, to Sandvik Aktiebolag. Coated cemented carbide body and method of making such a body. 4,180,400, Cl. 75-235.000.

Smith, William R., to Caere Corporation. Apparatus and method for recognizing characters. 4,180,799, Cl. 340-146.3AC.

Sneider, Vincent R. Disposable syringes. 4,180,072, Cl. 128-227.000.

Snyder, Richard C., to Pullman Incorporated. Freight car door post. 4,180,000, Cl. 105-409.000.

Snyder, Richard C.; and Bodinger, Donald C., to Pullman Incorporated. Pipe clamp. 4,180,228, Cl. 248-74.00R.

Snyder, Ronald R.: *See*—
Kirkpatrick, Robert G.; and Snyder, Ronald R., 4,179,978, Cl. 89-12.000.

Societe Anonyme Automobiles Citroen: *See*—
Gonzales, Boris, 4,180,713, Cl. 200-52.00R.

Societe Anonyme des Usines Chausson: *See*—
Plegat, Alain E., 4,180,032, Cl. 123-119.0CD.

s.a. Texaco Belgium n.v.: *See*—
Hermans, Johny C., 4,180,641, Cl. 528-27.000.
Hermans, Johny C., 4,180,653, Cl. 528-391.000.

Societe Commerciale Chauvin Arnoux Societe Anonyme Francaise: *See*—
Guyot, Pierre; Coty, Alain; and Delfau, Paul, 4,180,823, Cl. 346-139.00B.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Graf, Manfred P., 4,180,594, Cl. 426-560.000.

Societe Europeenne de Propulsion: *See*—
Habermann, Helmut, 4,180,296, Cl. 308-10.000.

Societe Igman: *See*—
Nanini, Antoine, 4,180,355, Cl. 407-113.000.

Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See*—
Bonse, Michael, 4,180,533, Cl. 261-39.00A.

Societe les Piles Wonder: *See*—
Stiker, Bernard; and Jolas, Fernand, 4,180,441, Cl. 204-2.100.

Sogabe, Motoshige: *See*—
Otsuka, Nobuyuki; Hirai, Seiichi; and Sogabe, Motoshige, 4,180,344, Cl. 403-57.000.

Sogoian, Nash P. Hanger for vehicle mud flaps. 4,180,230, Cl. 248-573.000.

Soltis, Andrew P.: *See*—
Ustin, George; and Soltis, Andrew P., 4,180,305, Cl. 339-198.00H.

Sonetaka, Kazunori: *See*—
Nishino, Atsushi; Sonetaka, Kazunori; Kimura, Kunio; and Watanabe, Yoshihiro, 4,180,482, Cl. 252-455.00R.

Sony Corporation: *See*—
Hagiwara, Yoshiaki, 4,179,793, Cl. 29-578.000.
Hamada, Osamu, 4,179,969, Cl. 84-1.010.
Koizumi, Akio; Nakazawa, Hiroshi; and Ohsawa, Mitsuo, 4,180,852, Cl. 363-49.000.
Nishikawa, Masaru; Numakura, Toshihiko; and Hirai, Jun, 4,180,833, Cl. 360-21.000.
Okumura, Haruhiko; and Kanaya, Masanori, 4,180,835, Cl. 360-118.000.

Sorrell, Malcolm E.: *See*—
Durden, Andrew; and Sorrell, Malcolm E., 4,180,164, Cl. 206-419.000.

Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; Sakae Riken Kogyo Co., Ltd.; and Dai Nippon Toryo Co., Ltd. Process for preparation of plastic molded articles having metal film. 4,180,448, Cl. 204-192.00C.

Soukup, Dale F.: *See*—
Saarem, Myrl J.; and Soukup, Dale F., 4,180,236, Cl. 251-30.000.

Souma, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-rattle spring member for a disc brake pad. 4,180,148, Cl. 188-73.500.

Southern Steel Company: *See*—
Youngblood, David H.; and Young, Quentin H., 4,180,287, Cl. 292-144.000.

Spaight, Ronald N.: *See*—
Joshi, Kailash C.; and Spaight, Ronald N., 4,179,802, Cl. 29-628.000.

Spanel, Abram N.: *See*—
Jacobs, David R., 4,180,218, Cl. 242-131.000.

Speco, Inc.: *See*—
Witte, Walter R., 4,180,212, Cl. 241-89.400.

Spector, George: *See*—
Morin, Fernand; and Spector, George, 4,180,266, Cl. 273-100.000.
Shiao, Monley M. Y.; and Spector, George, 4,180,773, Cl. 324-86.000.
Warren, Florien J.; and Spector, George, 4,179,784, Cl. 29-283.000.

Speed Systems, Inc.: *See*—
Maytham, Walter J., 4,179,804, Cl. 30-90.700.

Speraw, Floyd G., to NCR Corporation. Variable fit fastener. 4,179,791, Cl. 29-526.00R.

Sperry, Peter R.: *See*—
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,180,645, Cl. 528-73.000.

Spivack, John D., to Ciba-Geigy Corporation. Hindered phenyl phosphites. 4,180,497, Cl. 260-45.8NT.

Spivack, John D., to Ciba-Geigy Corporation. Hindered phenyl phosphites. 4,180,498, Cl. 260-45.8NT.

Sport-Fun, Inc.: *See*—
Gottlieb, Clifford C., 4,180,278, Cl. 280-87.04A.

Spott, Hasso: *See*—
Schrodter, Klaus; Kandler, Joachim; and Spott, Hasso, 4,180,471, Cl. 252-140.000.

Spranger, Paul B., to Altec Corporation. Adjustably positioned phasing plug. 4,180,710, Cl. 179-115.50H.

Stadler, Paul, to Sandoz Ltd. N-9,10-dihydrolysergyl-m-aminobenzoic acid amide derivative. 4,180,581, Cl. 424-261.000.

Stahlwerke Peine-Salzgitter A.G.: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Stair, Leslie D., to Boeing Company, The. System to transfer cargo or passengers between platforms while undergoing relative motion. 4,180,362, Cl. 414-139.000.

Stanadyne, Inc.: *See*—
Clark, Calvin M., 4,179,967, Cl. 83-846.000.

Standard Oil Company (Indiana): *See*—
Goddin, Clifton S., Jr.; and Palm, John W., 4,180,554, Cl. 423-574.00R.

Stapp, Paul R., to Phillips Petroleum Company. Conversion of conjugated diolefins to diacyloxy olefins. 4,180,676, Cl. 560-246.000.

Staufer, Adolf, to Fischer Gesellschaft m.b.H. Implement for striking a ball. 4,180,265, Cl. 273-73.00D.

Stauffer Chemical Company: *See*—
Photis, James M., 4,180,674, Cl. 560-52.000.
Sherif, Fawzy G.; and Irani, Mazin R., 4,180,630, Cl. 521-106.000.

Steel Engineering Company Limited, The: *See*—
Wallace, Trevor E., 4,179,983, Cl. 92-85.00B.

Steffan, Guido: *See*—
Behre, Horst; Putter, Rolf; and Steffan, Guido, 4,180,521, Cl. 260-505.00C.

Steffensen, Leslie M.; Dutell, H. Gary; and Rydell, Robert A., to Georgia-Pacific Corporation. Apparatus for drying veneer. 4,179,820, Cl. 34-92.000.

Steiger, Douglass W.; and Johnson, Clifton E. Attachment device for a fork lift. 4,180,363, Cl. 414-347.000.

Stein, Robert G., to Abbott Laboratories. Certain ovicidal piperazines. 4,180,574, Cl. 424-250.000.

Steinacker, Karl-Heinz: *See*—
Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, 4,180,438, Cl. 203-89.000.

Steinbrenner, Ulrich; Kirn, Dieter; and Schnurle, Hans, to Robert Bosch GmbH. Fuel injection system. 4,180,025, Cl. 123-32.0EA.

Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, to Audi Nsu Auto Union Aktiengesellschaft. Fuel injection system for an internal combustion engine. 4,180,038, Cl. 123-139.0AW.

Stepanov, Vladimir M.: *See—*
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.

Stephen, Robert L.: *See—*
Jacobsen, Stephen C.; Stephen, Robert L.; and Hansen, Peter, 4,180,068, Cl. 128-214.00R.

Sterling Drug Inc.: *See—*
Michne, William F., 4,180,667, Cl. 546-112.000.

Stern, Gerhard; and Dobramysl, Wilhelm, to Chemie Linz Aktiengesellschaft. Storage-stable lacquer resins. 4,180,488, Cl. 260-21.000.

Steuer, Paul R., to Young Windows Inc. Hinge. 4,179,844, Cl. 16-171.000.

Stevens, Travis E.: *See—*
Kim, Samuel S.; and Stevens, Travis E., 4,180,491, Cl. 260-29.2TN.

Stevick, Ronald A., to Industrial Service & Manufacturing Co. Multiple pitch self-cleaning belt pulley. 4,180,155, Cl. 198-498.000.

Stichting Energieonderzoek Centrum Nederland: *See—*
Theyse, Frederik H., 4,179,951, Cl. 74-572.000.

Stiker, Bernard; and Jolas, Fernand, to Societe les Piles Wonder. Process for making negative electrodes for electrochemical generators, and the negative electrodes thus obtained. 4,180,441, Cl. 204-2.100.

Stith, Joe D.: *See—*
Neisler, Boyd L.; and Stith, Joe D., 4,179,851, Cl. 51-101.0LG.

Stone Construction Equipment, Inc.: *See—*
Tertinek, Christian T., 4,180,281, Cl. 280-457.000.

Strom, Janeric: *See—*
Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, 4,180,018, Cl. 122-225.00R.

Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, to Suami, Tetsuo. Nitrosourea derivatives. 4,180,655, Cl. 536-17.00R.

Suditu, Ion: *See—*
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.

Sueyoshi, Akiko: *See—*
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,180,417, Cl. 148-6.15Z.

Sugita, Haruko: *See—*
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.

Sugiura, Hiroshi: *See—*
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.

Sugiura, Masatoshi: *See—*
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.

Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., to Singer Company, The. Real-time simulation of a polygon face object system as viewed by a moving observer. 4,179,823, Cl. 35-10.240.

Sumitomo Electric Industries, Ltd.: *See—*
Isshiki, Isao; Ohoka, Akihiro; and Sato, Koji, 4,180,800, Cl. 340-146.3SY.

Sumitomo, Hiroyuki, to Hisaka Works, Ltd. Plate type condenser. 4,180,129, Cl. 165-110.000.

Sun Ventures, Inc.: *See—*
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 4,180,466, Cl. 252-48.600.

Sunkist Growers, Inc.: *See—*
Goertz, LeRoy E., 4,180,151, Cl. 198-367.000.

Suys, Andre R.; and Van Landeghem, Willy K., to AGFA-GEVAERT N.V. X-ray intensifying screens. 4,180,740, Cl. 250-483.000.

Suzuki, Haruyuki: *See—*
Takahashi, Toshiyuki; Koike, Masahiko; and Suzuki, Haruyuki, 4,179,971, Cl. 84-1.240.

Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,179,968, Cl. 84-1.010.

Suzuki, Hideo, to Fujisoku Electric Co., Ltd. Switch having lock-off and lock-on. 4,180,716, Cl. 200-320.000.

Suzuki, Masanori: *See—*
Miyazaki, Yasushi; Suzuki, Masanori; and Kaneko, Hideaki, 4,180,406, Cl. 106-14.150.

Suzuki, Tsutomu: *See—*
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, 4,179,972, Cl. 84-1.110.

Suzuki, Yutaka: *See—*
Hobo, Nobuhito; Suzuki, Yutaka; Naito, Takashi; and Konishi, Yoshimune, 4,180,037, Cl. 123-139.00E.

Svarovsky, Ladislav, to University of Bradford. Method and apparatus for monitoring particle sizes. 4,179,934, Cl. 73-432.0PS.

Swanson, Robert L.: *See—*
Blake, William J., 4,180,346, Cl. 403-109.000.

Swarts, William A.: *See—*
Mageli, Orville L.; and Swarts, William A., 4,180,518, Cl. 260-453.0RZ.

Swingline, Inc.: *See—*
Raasch, Ernest M.; and Olney, Nathaniel M., 4,180,197, Cl. 227-120.000.

Swiss Aluminium Ltd.: *See—*
Burkhard, Kurt; and Kunzmann, Peter, 4,180,622, Cl. 428-564.000.

Switchcraft, Inc.: *See—*
Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., 4,180,712, Cl. 200-16.00D.

Sygnator, Henry A., to Illinois Tool Works Inc. Extruding and tapping screw and blank for manufacture of such screw. 4,179,976, Cl. 85-47.000.

Syntex Corporation: *See—*
Katz, Martin; and Kent, John S., 4,180,560, Cl. 424-21.000.

Syntex (USA) Inc.: *See—*
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,180,308, Cl. 351-160.00H.

Szilagyi nee Farago, Katalin: *See—*
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.

Szmuszkovicz, Jacob: *See—*
Kane, Michael P.; and Szmuszkovicz, Jacob, 4,180,522, Cl. 260-562.00R.

Szondy, Eleonora: *See—*
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.

Szupillo, Raymond E., to Corning Glass Works. Electrical contacts for electrically conductive carbon glasses. 4,180,723, Cl. 219-541.000.

Taciuk, William, to Alberta Oil Sands Technology and Research Authority. Process for thermal cracking a heavy hydrocarbon. 4,180,455, Cl. 208-126.000.

Taisei Kosan Kabushiki Kaisha: *See—*
Kamezaki, Masaaki, 4,180,093, Cl. 137-360.000.

Takaba, Toshio; and Kobayashi, Toshimasa, to Nippon Electric Company, Ltd. Printed wiring board comprising a conductive pattern retreating at least partly in a through-hole. 4,179,800, Cl. 29-625.000.

Takada, Shigetaka: *See—*
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.

Takagi, Nobuho; Maegawa, Muneo; and Nii, Katsutoshi, to Hitachi, Ltd. Sealing device for rotor shaft of fluid machine. 4,180,273, Cl. 277-154.000.

Takago, Toshio, to Shin-Etsu Chemical Company. Room temperature curable organopolysiloxane compositions. 4,180,642, Cl. 528-32.000.

Takahashi, Toshio: *See—*
Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, 4,180,468, Cl. 252-117.000.

Takahashi, Toshiyuki; Koike, Masahiko; and Suzuki, Haruyuki, to Nippon Gakki Seizo Kabushiki Kaisha. Pitch bend apparatus for electronic musical instrument. 4,179,971, Cl. 84-1.240.

Takahashi, Yasuyoshi; Sekiguchi, Shigeo; and Sato, Teruyoshi, to Tokyo Electric Co., Ltd. Merchandise sales control system. 4,180,206, Cl. 235-419.000.

Takakuwa, Yasuo: *See—*
Yanagimoto, Akira; Kumazawa, Shunichi; and Takakuwa, Yasuo, 4,180,496, Cl. 260-45.8NT.

Takayama, Yoshikazu: *See—*
Yamaguchi, Shoshichi; Okasaka, Sadaatsu; and Takayama, Yoshikazu, 4,180,708, Cl. 179-2.0EB.

Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Brake proportioning means. 4,180,295, Cl. 303-22.00R.

Takeuchi, Takeshi: *See—*
Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, 4,180,804, Cl. 340-310.00R.

Takeuchi, Toshio, to Kabushiki Kaisha Oichi. Foot-operated rotary massaging device. 4,180,063, Cl. 128-25.00B.

Tamano, Hideki: *See—*
Hirota, Kiwami; Tamano, Hideki; and Inazawa, Shintaro, 4,180,636, Cl. 526-125.000.

Tamarkin, Lev Z.: *See—*
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Tamura, Gakuzo; and Shimizu, Kenichi, to Kyowa Hakko Kogyo Co., Ltd. Antibacterial compounds and process for production thereof. 4,180,436, Cl. 435-119.000.

Tanahashi, Toshio: *See—*
Sanda, Shougo; Nakamura, Noriniko; and Tanahashi, Toshio, 4,180,044, Cl. 123-191.00S.

Tanaka, Asami. Mixing tray assembly. 4,180,159, Cl. 206-63.500.

Tanaka, Makoto: *See—*
Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,180,039, Cl. 123-139.0AW.

Tanaka, Yasuo: *See—*
Shimokawa, Kenji; Nagatomo, Muneshige; and Tanaka, Yasuo, 4,179,895, Cl. 62-2.000.

Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,180,039, Cl. 123-139.0AW.

Tandy Brands, Inc.: *See—*
Clark, Edward J., 4,179,755, Cl. 2-322.000.

Tanoue, Shizuo: *See—*
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.

Taplin, Harry R.: *See—*
Cook, Charles C.; and Taplin, Harry R., 4,179,921, Cl. 73-112.000.

Tate, Leslie R.: *See*—
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,180,545, Cl. 423-8.000.

Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Two-dimensional scanning apparatus with constant speed scan. 4,180,307, Cl. 350-6.500.

Tauscher, Heinrich E. Handsaw with specialized cutting teeth. 4,180,110, Cl. 145-31.00R.

Taylor, Joe N., to Mack Trucks, Inc. Two-piece oil-cooled piston. 4,180,027, Cl. 123-41.350.

Taylor, Richard H. Subsurface irrigation and drainage system. 4,180,348, Cl. 405-39.000.

TDK Electronics Co., Ltd.: *See*—
Shiba, Haruo; and Sato, Takateru, 4,180,220, Cl. 242-199.000.

Teague, Walter D., Jr.; and Semplinei \rthur T. Nutating device with provision for utilization of motive fluid. 4,179,765, Cl. 15-22.00R.

Tee, William J.: *See*—
Smith, Kenneth C. A.; and Tee, William J., 4,180,738, Cl. 250-396.0ML.

Teijin Limited: *See*—
Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, 4,180,672, Cl. 560-15.000.

Tele/Resources, Incorporated: *See*—
Ferraro, Angelo, 4,180,768, Cl. 323-9.000.

Telecommunications Radioelectriques et Telephoniques TRT: *See*—
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,180,705, Cl. 178-69.100.

Temco Products, Inc.: *See*—
Thomas, Morton I., 4,180,086, Cl. 135-67.000.

Temple, Stephen: *See*—
McCombie, Alan K.; and Temple, Stephen, 4,180,194, Cl. 226-113.000.

Tennessee Valley Authority: *See*—
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,180,545, Cl. 423-8.000.

Tension Envelope Corporation: *See*—
Hiersteiner, Walter L., 4,180,168, Cl. 206-626.000.

Tertinek, Christian T., to Stone Construction Equipment, Inc. Safety chain arrangement for towed vehicles. 4,180,281, Cl. 280-457.000.

Texaco Development Corp.: *See*—
Marquis, Edward T.; and Yeakey, Ernest L., 4,180,644, Cl. 528-68.000.
Moss, Philip H.; and Nieh, Edward C. Y., 4,180,643, Cl. 528-52.000.

Texaco Inc.: *See*—
Lewis, Charles T., Jr.; and Prescott, Gerald F., 4,180,696, Cl. 585-717.000.

Texacone Company, The: *See*—
Wheeler, John H., 4,179,856, Cl. 51-241.00S.

Texas A&M University System: *See*—
Clearfield, Abraham, 4,180,551, Cl. 423-249.000.

Texas Instruments Incorporated: *See*—
Burson, David C., 4,180,805, Cl. 340-709.000.
Sloan, Benjamin J., 4,180,749, Cl. 307-299.00B.

Textron Inc.: *See*—
Cook, Trix C., 4,179,831, Cl. 40-19.500.
Hsu, William W.; and McPherson, Robert, 4,180,243, Cl. 251-234.000.
MacFee, Norman W., 4,179,787, Cl. 29-408.000.

Theis, Gunter: *See*—
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.

Theyse, Frederik H., to Stichting Energieonderzoek Centrum Nederland. Flywheel rotor particularly suitable for accumulating energy. 4,179,951, Cl. 74-572.000.

Thiault, Georges: *See*—
Le Guen, Yves; and Thiault, Georges, 4,180,510, Cl. 549-79.000.

Thoma, Richard: *See*—
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.

Thomas, Charles E., to General Electric Company. Dynamic array aperture and focus control for ultrasonic imaging systems. 4,180,790, Cl. 367-7.000.

Thomas, Harold A., to McClung, Harold A.; and Thomas, Harold A. Fisherman's leader caddy. 4,179,834, Cl. 43-57.50R.

Thomas, Morton I., to Temco Products, Inc. Hyperextendible walker. 4,180,086, Cl. 135-67.000.

Thompson, Floyd A., Jr., to M. W. Dunton Company. Solder flux. 4,180,419, Cl. 148-23.000.

Thompson, Stanley C. Weight adjustment of golfing iron heads. 4,180,269, Cl. 273-171.000.

Thornburg, Francis L., to Lockheed Aircraft Corporation. Aileron segment control for a flaperon system. 4,180,222, Cl. 244-75.00R.

Thorsen, Niels P.: *See*—
Hansen, Peter R.; and Thorsen, Niels P., 4,180,714, Cl. 200-81.00R.

Three Phoenix Company: *See*—
Barnett, David L., 4,179,852, Cl. 51-132.000.

Thresher Institutes, Incorporated: *See*—
Clark, Herbert J., 4,179,836, Cl. 43-77.000.

Thurmond, Gary D.: *See*—
Forward, Robert L.; and Thurmond, Gary D., 4,180,786, Cl. 333-32.000.

Thyssen Edelstahlwerke Aktiengesellschaft: *See*—
Frehn, Fritz, 4,180,401, Cl. 75-236.000.

Tiemann, Jerome J., to General Electric Company. Simplified sector scan ultrasonic imaging system. 4,180,791, Cl. 367-105.000.

Tiemann, Jerome J.: *See*—
Lederman, Frank L.; and Tiemann, Jerome J., 4,180,792, Cl. 367-7.000.

Tiep, Brian L., to City of Hope National Medical Center. Method of measuring intrathoracic pressure. 4,180,059, Cl. 128-721.000.

Tintometer GmbH: *See*—
Voss, Cay-Peter; and Nowak, Manfred, 4,180,009, Cl. 116-206.000.

Tirboiu, Dumitru: *See*—
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.

Tire-Gator, Inc.: *See*—
Johnson, Albert O., 4,180,004, Cl. 110-346.000.

Titan Specialties, Inc.: *See*—
Echols, Robert B.; and Berry, William J., 4,179,991, Cl. 102-21.600.

Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., to Bendix Corporation, The. Integral piston and adjuster for a brake. 4,180,147, Cl. 188-71.800.

Toepffer, Kurt: *See*—
Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, 4,180,438, Cl. 203-89.000.

Togawa, Toshikatsu: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.

Tokas, Edward F., to Monsanto Company. Molding compositions and process for preparing same. 4,180,486, Cl. 260-4.0AR.

Tokosh, Richard; and Cahn, Arno, to Lever Brothers Company. Method for improved acyl isethionate detergent bars. 4,180,470, Cl. 252-121.000.

Tokutomi, Seijiro: *See*—
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, 4,180,309, Cl. 354-25.000.

Tokyo Electric Co., Ltd.: *See*—
Takahashi, Yasuyoshi; Sekiguchi, Shigeo; and Sato, Teruyoshi, 4,180,206, Cl. 235-419.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Naito, Makoto; and Kasami, Akinobu, 4,180,423, Cl. 148-171.000.
Omi, Tadao; Watanabe, Minoru; and Nishimura, Toshio, 4,180,478, Cl. 252-301.40H.

Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, to Richter Gedeon Vegyeszet, Gyar RT. Novel steroidspirooxazolidines and process for their preparation. 4,180,505, Cl. 260-239.55R.

Tolerson, Lawrence E. Carrier. 4,180,299, Cl. 312-242.000.

Tomczak, Lawrence W., to Chrysler Corporation. Mounting for paddlewheel photoelectric transducer. 4,179,924, Cl. 73-229.000.

Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, to Lion Fat & Oil Co., Ltd., The. Disubstituted aliphatic carboxylamidoamines as well as detergents and toiletry compositions containing same. 4,180,468, Cl. 252-117.000.

Tomita, Joseph T.: *See*—
Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., 4,180,556, Cl. 424-1.000.

Tomy Kogyo Co., Inc.: *See*—
Iwao, Noriaki, 4,179,825, Cl. 35-32.000.

Topla, Ltd.: *See*—
Nakagawa, Yasuharu, 4,179,760, Cl. 4-166.000.

Torneback, Axel G. Load carrying vehicle trailer. 4,180,172, Cl. 414-522.000.

Tornerfelt, Gosta T. I., to AB Trelleborgplast. Process of manufacturing a wall having an opening therein, and a door or cover therefor. 4,179,790, Cl. 29-416.000.

Toro Company, The: *See*—
Bivens, Jon A., 4,180,850, Cl. 362-285.000.

Toru, Takeshi: *See*—
Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, 4,180,672, Cl. 560-15.000.

Towmotor Corporation: *See*—
Hildebrecht, Harold V., 4,179,949, Cl. 74-474.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Munekata, Kenichi; Ohta, Takeshi; and Ohshima, Susumu, 4,179,854, Cl. 51-165.770.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.
Moriyama, Masakazu, 4,179,876, Cl. 58-50.00R.
Onishi, Sigeru, 4,180,029, Cl. 123-73.00A.
Saiki, Junichi; and Kumai, Teruo, 4,180,035, Cl. 123-119.00A.
Sanda, Shougo; Nakamura, Noriniko; and Tanahashi, Toshio, 4,180,044, Cl. 123-191.00S.
Shimizu, Hidetoshi, 4,180,294, Cl. 303-6.00C.
Souma, Teruo, 4,180,148, Cl. 188-73.500.
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.
Yanagihara, Hiromichi, 4,180,021, Cl. 123-32.0ST.

TP Laboratories, Inc.: *See*—
Hoffman, Carl S., 4,179,815, Cl. 433-140.000.

Trankle, Rick. Percussion accessory. 4,179,974, Cl. 84-411.00P.

Transac - Compagnie pour le Developpement des Transactions Automatiques: *See*—
Michaud, Andre, 4,180,837, Cl. 360-18.000.

Trethewy, Brian R.: *See*—
Caley, Kenneth E.; and Trethewy, Brian R., 4,180,195, Cl. 227-51.000.
Trio Kabushiki Kaisha: *See*—
Yamada, Tsuneo; and Miyamoto, Yukihiko, 4,180,777, Cl. 325-363.000.
Trott, David W.: *See*—
Howell, Carl J., Jr.; Trott, David W.; and Riley, Jesse L., 4,180,536, Cl. 264-53.000.
Trufanov, Pavel A.: *See*—
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.
Trustul Petrolului Bolintin: *See*—
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.
TRW Inc.: *See*—
van Buren, Harold S., Jr., 4,179,977, Cl. 85-81.000.
Tsubota, Junjiro. Method and apparatus for obtaining useful work from wave energy. 4,179,886, Cl. 60-398.000.
Tsuchiya, Hiroyoshi: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Tsuda, Yukifumi: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Tsuji, Takao: *See*—
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.
Tucek, Frank J., to J. I. Case Company. Cylinder assembly with split ring retainer. 4,180,274, Cl. 277-192.000.
Tufvesson, Kent A.: *See*—
Harre, Kurt J. S.; and Tufvesson, Kent A., 4,180,217, Cl. 242-84.20A.
Turkdogan, Ethem T.: *See*—
Olsson, Robert G.; and Turkdogan, Ethem T., 4,180,549, Cl. 423-230.000.
Turnbull, James H.: *See*—
Lovering, David G.; and Turnbull, James H., 4,180,616, Cl. 428-389.000.
Turner, Lloyd S. Container and closure. 4,180,178, Cl. 220-281.000.
Twist, Ernest F., to USM Corporation. Dust stop. 4,180,332, Cl. 366-279.000.
Tyagunov, Boris I.: *See*—
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.
Ube Industries, Ltd.: *See*—
Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,180,607, Cl. 528-112.000.
Ueda, Shinya, to Fuji Electric Co., Ltd. Infrared ray gas analyzing apparatus. 4,180,733, Cl. 250-345.000.
Ueshima, Michio: *See*—
Wada, Masahiro; Ueshima, Michio; Yanagisawa, Isao; and Ninomiya, Michikazu, 4,180,678, Cl. 562-534.000.
Ujiie, Nobuhisa, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for granulation of molten slags. 4,180,250, Cl. 266-137.000.
Ukigai, Toshiyuki: *See*—
Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, 4,180,468, Cl. 252-117.000.
Ulanen, Yalmar S.: *See*—
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.
UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta, S.p.A.: *See*—
Raiteri, Angelo, 4,179,868, Cl. 53-571.000.
Union Carbide Corporation: *See*—
Coast, John B., 4,180,256, Cl. 270-83.000.
Vidal, Jose L.; and Walker, Wellington E., 4,180,517, Cl. 260-449.00L.
United Gas Industries Limited: *See*—
Davies, Ronald W., 4,180,380, Cl. 431-31.000.
United Kingdom Atomic Energy Authority: *See*—
Drain, Leslie E., 4,180,328, Cl. 356-349.000.
United Kingdom of Great Britain and Northern Ireland, Secretary of State for Industry in Her Britannic Majesty's Government of the: *See*—
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,180,171, Cl. 212-61.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Fitzgerald-Smith, James P.; and Knight, Derek I., 4,180,364, Cl. 414-350.000.
Hill, Orvin G., 4,180,815, Cl. 343-6.50R.
United States of America
Agriculture: *See*—
Klesius, Phillip H.; and Fudenberg, Herman H., 4,180,627, Cl. 435-262.000.
Air Force: *See*—
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., 4,180,725, Cl. 250-207.000.
Fritts, David H., 4,179,799, Cl. 29-623.500.
Hildebrand, James R., 4,180,329, Cl. 356-375.000.
Hook, William R.; and Hilberg, Ronald P., 4,180,779, Cl. 329-50.000.
Army: *See*—
Babbitt, Richard W., 4,179,795, Cl. 29-602.00R.
Levy, Stephen, 4,180,754, Cl. 313-93.000.
Marshall, Sidney; and Zeto, Robert J., 4,179,792, Cl. 29-571.000.
Ramnarace, Jawaharlal; and Wood, William A., 4,179,992, Cl. 102-45.000.
Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., 4,180,424, Cl. 149-19.400.
Rhoades, Richard G., 4,180,535, Cl. 264-3.00R.
Wolpert, Stephen M.; and Nerath, Gustav J., 4,180,599, Cl. 427-54.100.
Energy: *See*—
Bamberger, Carlos E.; and Richardson, Donald M., deceased, 4,180,555, Cl. 423-657.000.
Goodman, Charles D., 4,180,736, Cl. 250-363.00R.
Hsieh, Edmund J., 4,180,775, Cl. 324-249.000.
Marchant, David D., 4,180,484, Cl. 252-521.000.
Riley, Robert E.; and Wallace Sr., Terry C., 4,180,428, Cl. 156-281.000.
Interior: *See*—
Divers, Edward F.; Berry, D. Randolph; and Monaghan, David A., 4,180,352, Cl. 405-303.000.
Gunderman, Robert J.; Alcock, Keith; Skinner, Charles S.; and Riley, Michael W., 4,180,177, Cl. 220-88.00A.
Marchant, Wayne N.; and Brooks, Parkman T., 4,180,628, Cl. 521-39.000.
National Aeronautics and Space Administration: *See*—
St. Clair, Terry L.; and St. Clair, Anne K., 4,180,648, Cl. 528-207.000.
Navy: *See*—
Forman, Donald B.; and Bradshaw, Phillip, 4,179,782, Cl. 29-268.000.
Lindstrum, Alan L., 4,180,793, Cl. 367-137.000.
McKechnie, John C., 4,179,919, Cl. 73-37.500.
Schwartz, Arnold, 4,180,205, Cl. 235-411.000.
U.S. Environmental Protection Agency: *See*—
Alphandary, Maurice, 4,180,186, Cl. 406-152.000.
U.S. Philips Corporation: *See*—
Breant, Pierre L. V.; and Fresnel, Alain C., 4,180,859, Cl. 364-565.000.
Hasker, Jan; and Peters, Cornelis, 4,179,777, Cl. 29-25.130.
Linder, Uno K. E., 4,180,333, Cl. 400-124.000.
Notelteirs, Victor R.; and Rijckaert, Josephus F., 4,180,758, Cl. 313-318.000.
Ochmann, Rudolf, 4,180,761, Cl. 315-292.000.
Schermer, Gijsbertus J. H.; Winters, Hubertus H. A.; Hildering, Willem C.; and Nickl von Nikelsberg, Karl F., 4,180,828, Cl. 357-79.000.
Voorman, Johannes O., 4,180,785, Cl. 332-9.00T.
United States Steel Corporation: *See*—
Galer, Herbert W., 4,180,176, Cl. 217-57.000.
Olsson, Robert G.; and Turkdogan, Ethem T., 4,180,549, Cl. 423-230.000.
United Technologies Corporation: *See*—
Conner, Gary E., 4,179,944, Cl. 74-89.150.
Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., 4,179,881, Cl. 60-39.710.
Moore, William A.; and Przirembel, Hans R., 4,180,373, Cl. 416-97.00R.
Scorso, Clifford A., Jr.; and Messer, Gordon J., 4,180,853, Cl. 363-96.000.
University of Akron, The: *See*—
Farona, Michael F.; and White, James F., 4,180,692, Cl. 585-457.000.
University of Bradford: *See*—
Svarovsky, Ladislav, 4,179,934, Cl. 73-432.0PS.
UOP Inc.: *See*—
Illingworth, George E., 4,180,691, Cl. 585-455.000.
Imai, Tamotsu, 4,180,690, Cl. 585-443.000.
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., 4,180,125, Cl. 165-48.000.
Up-Right, Inc.: *See*—
Claxton, Gerald L., 4,179,871, Cl. 56-330.000.
Upjohn Company, The: *See*—
Hester, Jackson B., Jr., 4,180,668, Cl. 260-244.400.
Kane, Michael P.; and Szmuszkovicz, Jacob, 4,180,522, Cl. 260-562.00R.
Lednicer, Daniel, 4,180,584, Cl. 424-274.000.
Sih, John C., 4,180,657, Cl. 542-426.000.
Smith, Herman W., 4,180,512, Cl. 260-345.200.
Urano, Fumio; and Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Interlocking device for indication in the finder of a single-lens reflex camera. 4,180,311, Cl. 354-53.000.
Uribe, Charles E. Pipe beveling attachment for a power tool. 4,180,358, Cl. 409-179.000.

Uskokovic, Milan R.: *See—*
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.

USM Corporation: *See—*
Twist, Ernest F., 4,180,332, Cl. 366-279.000.

Ustin, George: and Soltis, Andrew P., to North American Philips Corporation. Sectional electrical terminal block. 4,180,305, Cl. 339-198.00H.

Uusitalo, Seppo J.: *See—*
Sipila, Heikki J.; and Uusitalo, Seppo J., 4,180,735, Cl. 250-358.00R.

Vac-Tec Systems, Inc.: *See—*
Morrison, Charles F., Jr., 4,180,450, Cl. 204-298.000.

Vaccari, Franco. Foot clamping device particularly for ski boots. 4,179,827, Cl. 36-119.000.

Vakil, Himanshu B., to General Electric Company. Vapor compression cycle device with multi-component working fluid mixture and method of modulating its capacity. 4,179,898, Cl. 62-114.000.

Valley, James F. Steering wheel cover. 4,179,950, Cl. 74-558.000.

Valukis, Robert W., to Electron Fusion Devices Inc. Metering valves. 4,180,239, Cl. 251-60.000.

Valve Concepts International, Inc.: *See—*
Muchow, John D., 4,180,238, Cl. 251-58.000.

van Bilderbeek, Bernard H., to Vetco, Inc. Pile forging. 4,180,349, Cl. 405-224.000.

van Buren, Harold S., Jr., to TRW Inc. Encapsulated fastener. 4,179,977, Cl. 85-81.000.

van der Lely, Cornelis. Soil cultivating implements. 4,180,134, Cl. 172-59.000.

Van Landeghem, Willy K.: *See—*
Suys, Andre R.; and Van Landeghem, Willy K., 4,180,740, Cl. 250-483.000.

van Strien, Johannes, to Heineken Technisch Beheer B.V. Method and an apparatus for measuring the carbon dioxide content in beer. 4,179,918, Cl. 73-19.000.

Vapor Corporation: *See—*
Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, 4,180,366, Cl. 414-540.000.

Varian Associates, Inc.: *See—*
Abu-Shumays, Ahmad, 4,180,739, Cl. 250-461.00R.
Gang, Robert E., 4,180,769, Cl. 324-319.000.

Varo Semiconductor, Inc.: *See—*
Allen, Richard, 4,179,796, Cl. 29-605.000.

Varta Batterie Aktiengesellschaft: *See—*
Winsel, August, 4,180,624, Cl. 429-54.000.

Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Article coated with fluoropolymer finish with improved scratch resistance. 4,180,609, Cl. 428-212.000.

Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Craze-resistant polysiloxane resin coatings and coating compositions containing a discontinuous phase. 4,180,613, Cl. 428-327.000.

Vecchiarelli, Francis, to Hunter Douglas International N.V. Cord lock mechanism for venetian blind. 4,180,118, Cl. 160-178.00C.

Veeder Industries, Inc.: *See—*
Smilgys, Bruno S., 4,180,202, Cl. 235-132.00R.

Vending Components, Inc.: *See—*
Zurit, David; Cerrato, Vincent; and Hines, James, 4,180,189, Cl. 222-400.700.

Verbrugge, Pieter A.; and Kramer, Petrus A., to Shell Oil Company. Preparation of nitriles. 4,180,520, Cl. 260-465.00R.

Verma, Monica H., to Du Pont de Nemours, E. I., and Company. Article coated with a water based alkyd resin primer. 4,180,610, Cl. 428-216.000.

Vernon, Alan: *See—*
Buckley, Keith; Vernon, Alan; and Lowe, Philip J., 4,180,592, Cl. 426-32.000.

Versar, Inc.: *See—*
Olcott, Eugene L.; and Abrams, Edwin F., 4,180,211, Cl. 239-265.430.

Vetco, Inc.: *See—*
van Bilderbeek, Bernard H., 4,180,349, Cl. 405-224.000.

Via, Thomas E.: *See—*
Florer, Richard H.; Via, Thomas E.; and Weaver, James M., 4,180,184, Cl. 222-41.000.

Vidal, Jose L.; and Walker, Wellington E., to Union Carbide Corporation. Catalyst and process for producing polyhydric alcohols and derivatives. 4,180,517, Cl. 260-449.00L.

Vinjukov, Jury G.: *See—*
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.

Vinson, William L. Hair pressing composition. 4,180,561, Cl. 424-71.000.

Violland, Robert: *See—*
Neel, Jean; and Violland, Robert, 4,180,519, Cl. 260-459.00A.

Viragh, Steve. Drain cover assembly. 4,180,094, Cl. 137-362.000.

Virog, John J., Jr.; and Von Hagel, Leo, to Maxcap, Inc. Blow molded plastic b ttle and antitamper cap. 4,180,175, Cl. 215-252.000.

Vital Signs, Inc.: *See—*
Milliken, Ralph A.; Wall, Terence D.; and Boelens, Martin, 4,180,066, Cl. 128-205.240.

Vlad, Constantin: *See—*
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Vogelsberg, William A., to General Motors Corporation. Exhaust gas recirculation control. 4,180,034, Cl. 123-119.00A.

Vogt, Berthold R.: *See—*
Wade, Peter C.; and Vogt, Berthold R., 4,180,579, Cl. 424-258.000.

Vohran Kunststofferzeugnisse GmbH: *See—*
Alber, Tassilo, 4,180,429, Cl. 156-425.000.

Volkswagenwerk AG: *See—*
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.

Voltarc Tubes, Inc.: *See—*
Durden, Andrew; and Sorrell, Malcolm E., 4,180,164, Cl. 206-419.000.

Von Hagel, Leo: *See—*
Virog, John J., Jr.; and Von Hagel, Leo, 4,180,175, Cl. 215-252.000.

Voorman, Johannes O., to U.S. Philips Corporation. Modulator for forming the product of two input signals. 4,180,785, Cl. 332-9.00T.

vor der Bruck, Dieter; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Acid disazo dyestuffs containing a substituted thiophene middle component. 4,180,503, Cl. 260-152.000.

Voss, Cay-Peter; and Nowak, Manfred, to Tintometer GmbH. Ion concentration testing apparatus. 4,180,009, Cl. 116-206.000.

Vsesojuzny Gosudarstvenny Nauchno-Issiedovatelsky I Proekthyinstitut Khimo-Forograficheskoi Promyshlennosti: *See—*
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., 4,180,402, Cl. 430-394.000.

W. R. Grace & Co.: *See—*
Winyall, Milton E.; and Abdo, Kamal M., 4,180,566, Cl. 424-127.000.

Wachter, Bernard, to Pyro Dynamics, Ltd. Apparatus for manufacturing cigarettes or the like. 4,180,082, Cl. 131-26.000.

Wada, Masahiro; Ueshima, Michio; Yanagisawa, Isao; and Ninomiya, Michikazu, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Process for preparing methacrylic acid. 4,180,678, Cl. 562-534.000.

Wade, Peter C.; and Vogt, Berthold R., to E. R. Squibb & Sons, Inc. 2-Substituted-1H-benz[de]-isoquinoline-1,3(2H)-diones. 4,180,579, Cl. 424-258.000.

Wagner, Gerolf, to Fichtel & Sachs AG. Liquid-cooled engine arrangement for a two-wheeled vehicle. 4,180,137, Cl. 180-33.00R.

Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Semiconductor liquid junction photocell using a $CuInS_2$ electrode. 4,180,625, Cl. 429-111.000.

Waki, Keiichi: *See—*
Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, 4,180,652, Cl. 525-437.000.

Wakodo Kabushiki Kaisha: *See—*
Ogawa, Kiyohisa; and Eshima, Seiji, 4,180,160, Cl. 206-210.000.

Waku, Makio: *See—*
Muranaka, Shigeo; Ochiai, Kokichi; and Waku, Makio, 4,180,031, Cl. 123-117.00A.

Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., to Hewlett-Packard Company. Programmable calculator having string variable editing capability. 4,180,854, Cl. 364-200.000.

Walker, Garland H., to Western Geophysical Co. of America. Fluid operated seismic generator. 4,180,139, Cl. 181-120.000.

Walker, Wellington E.: *See—*
Vidal, Jose L.; and Walker, Wellington E., 4,180,517, Cl. 260-449.00L.

Wall, Terence D.: *See—*
Milliken, Ralph A.; Wall, Terence D.; and Boelens, Martin, 4,180,066, Cl. 128-205.240.

Wallace Sr., Terry C.: *See—*
Riley, Robert E.; and Wallace Sr., Terry C., 4,180,428, Cl. 156-281.000.

Wallace, Trevor E., to Steel Engineering Company Limited, The. Hydraulic percussive machines. 4,179,983, Cl. 92-85.00B.

Walter, Alfred, to Alfred Walter AG. Method of and apparatus for measuring the flexural stiffness of a sheet like sample. 4,179,941, Cl. 73-854.000.

Walter, Eberhard: *See—*
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.

Walters, Ralph, to West Company, The. Plunger rod and piston for a syringe. 4,180,069, Cl. 128-218.00P.

Ward, John, to Jessop Enterprises Pty. Ltd. Cascade solar fluid heater. 4,180,057, Cl. 126-449.000.

Ward, Stanley A., to Imperial Chemical Industries Limited. Ammonia synthesis reactor having parallel feed to plural catalyst beds. 4,180,543, Cl. 422-148.000.

Warner-Lambert Company: *See—*
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.

Warren, Florien J.; and Spector, George. Tool for installing vehicular coil springs. 4,179,784, Cl. 29-283.000.

Warren, Joseph R.: *See—*
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,180,856, Cl. 364-466.000.

Watanabe, Akinori; and Shinozuka, Katsumasa, to Oki Electric Industry Co., Ltd. Dot printer. 4,180,334, Cl. 400-124.000.

Watanabe, Hirozi: *See—*
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,180,188, Cl. 222-368.000.

Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, to Hochiki Corporation. Remote control device for an amplifier trap circuit. 4,180,804, Cl. 340-310.00R.

Watanabe, Minoru: *See*—
Omi, Tadao; Watanabe, Minoru; and Nishimura, Toshio, 4,180,478, Cl. 252-301.40H.

Watanabe, Tsutomu; Yanagawa, Nobuyuki; and Hosaka, Masao, to Ricoh Company, Ltd. Method of controlling fixing temperature of powder image in electrophotographic copying machine. 4,180,721, Cl. 219-216.000.

Watanabe, Yoshihiro: *See*—
Nishino, Atsushi; Sonetaka, Kazunori; Kimura, Kunio; and Watanabe, Yoshihiro, 4,180,482, Cl. 252-455.00R.

Watanabe, Yukihiro: *See*—
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.

Watson, Charles J.: *See*—
Langrehr, Larry L.; and Watson, Charles J., 4,180,321, Cl. 355-83.000.

Watts, James P., to Early California Industries, Inc. Method for forming foundation piers. 4,180,350, Cl. 405-233.000.

Weatherford/DMC: *See*—
Chammas, Edmond D., 4,180,131, Cl. 166-55.000.

Weaver, James M.: *See*—
Florer, Richard H.; Via, Thomas E.; and Weaver, James M., 4,180,184, Cl. 222-41.000.

Webb, Paul D., to Ingersoll-Rand Company. Thrust piston biasing means. 4,180,089, Cl. 137-115.000.

Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., to Boehringer Ingelheim GmbH. 1-Piperazino-6-phenyl-4H-s-triazolo[3,4-c]thieno[2,3-e]1,4-diazepines. 4,180,573, Cl. 424-250.000.

Weber, Larry F., to Interstate Electronics Corp. Driver circuitry for plasma display panel. 4,180,762, Cl. 315-169.400.

Wegge, Heinrich, to Wegurit Gesellschaft mbH Pipelinebedarf & Co. Device for closing-off the space defined between an inner pipe and an outer shield tube. 4,180,101, Cl. 138-103.000.

Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, to Ciba-Geigy Corporation. Cosmetic compositions containing polymeric quaternary ammonium salts. 4,180,084, Cl. 132-7.000.

Wegurit Gesellschaft mbH Pipelinebedarf & Co.: *See*—
Wegge, Heinrich, 4,180,101, Cl. 138-103.000.

Weiler, Paul; and Brummer, Dietmar, to Robert Bosch GmbH. Wiping arrangement for wiping a vehicle window. 4,179,766, Cl. 15-250.320.

Weiler, Paul; and Brummer, Dietmar, to Robert Bosch GmbH. Wiping arrangement for wiping a vehicle window. 4,179,767, Cl. 15-250.320.

Weisbach, Michael F.: *See*—
Nelson, Donald J.; Pistoresi, Denis J.; and Weisbach, Michael F., 4,180,784, Cl. 331-94.5PE.

Weiss, Martin J.: *See*—
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Weller, Ronald W.: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,180,259, Cl. 271-200.000.

Wellman, Stanley P.: *See*—
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., 4,180,133, Cl. 172-26.000.

Welton, Charles L.: *See*—
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Werner, Peter: *See*—
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Werstler, Lawrence J.: *See*—
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Wesemeyer, Jurgen; and Haubner, Georg, to Robert Bosch GmbH. Remote control system with pulse addressing, and safety warning indication. 4,180,803, Cl. 340-164.00R.

West Company, The: *See*—
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West, Donald L.: *See*—
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Western Electric Co., Inc.: *See*—
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., 4,180,757, Cl. 313-315.000.
Einbinder, Itamar B.; and Hamilton, Albert A., 4,179,798, Cl. 29-622.000.

Western Geophysical Co. of America: *See*—
Mollere, John C., 4,180,103, Cl. 138-109.000.
Walker, Garland H., 4,180,139, Cl. 181-120.000.

Westinghouse Air Brake Company: *See*—
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Westinghouse Electric Corp.: *See*—
Engel, Joseph C., 4,180,841, Cl. 361-45.000.
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Wilson, John R.; and Wolski, Jerome C., 4,180,846, Cl. 361-357.000.

Whalen, Robert. Jar and bottle opener. 4,179,954, Cl. 81-3.440.

Wheeler, John H., to Texacone Company, The. Sanding sleeve assembly. 4,179,856, Cl. 51-241.00S.

Wheldon, Robert J.; and Neale, Christopher V., to English Electric Valve Company Limited. Thyratrons. 4,180,756, Cl. 313-193.000.

Whirlpool Corporation: *See*—
Carr, Keith E.; and Kimball, Vance A., 4,180,049, Cl. 126-21.00A.

White, Alan C.: *See*—
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White, Charles M., to Harris Corporation. High speed deflection yoke driver circuit. 4,180,765, Cl. 315-408.000.

White Consolidated Industries, Inc.: *See*—
Berges, Jon F.; and Woolley, James M., 4,180,085, Cl. 134-57.00D.
Woolley, James M.; and Berges, Jon F., 4,180,095, Cl. 137-387.000.

White, James F.: *See*—
Farona, Michael F.; and White, James F., 4,180,692, Cl. 585-457.000.

White, Velton C. Dental bracket bonding agent and method of use. 4,179,812, Cl. 433-9.000.

White, Wesley C., to Partee Products. Musical shaker. 4,179,973, Cl. 84-402.000.

Whitman, Robert H.; and Barber, William A., to American Cyanamid Company. Microcrystalline cellulose as extrusion aid/combustible filler for alumina. 4,180,411, Cl. 106-41.000.

Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, to Schering Aktiengesellschaft. 17β-Hydroxy-4-androsten-3-ones and process for the preparation thereof. 4,180,570, Cl. 424-243.000.

Wieland-Werke Aktiengesellschaft: *See*—
Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, 4,179,911, Cl. 72-78.000.

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Wikings Mekaniska Verkstad AB: *See*—
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Wildforster, Emil, to Zarges Leichtbau GmbH. Apparatus for transporting and depositing panels. 4,180,258, Cl. 271-196.000.

Wilkinson, James R., Sr., to Container Corporation of America. Lockable tray. 4,180,200, Cl. 229-32.000.

Williamson, Warren G., to Robertshaw Controls Company. Push type thermal device and method of making the same and a stem seat therefor and method of making the same. 4,179,928, Cl. 73-368.300.

Wilmers, Gottlieb: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.

Wilson, John R.; and Wolski, Jerome C., to Westinghouse Electric Corp. Vertical bus bars for motor control center. 4,180,846, Cl. 361-357.000.

Wilson, Martin S.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Wilson, Woodrow A.; and Koska, Herschel O., to Koska, Herschel O., by said Woodrow A. Wilson. Portable, vehicle-mounted, self-contained alarm clock. 4,179,877, Cl. 58-56.000.

Wing, Thomas W. Electroacupuncture instrument. 4,180,079, Cl. 128-422.000.

Winn, Martin, to Abbott Laboratories. 2-(N-phenethyl-4-piperidino)-5-pentyl resorcinol. 4,180,669, Cl. 546-240.000.

Winsel, August, to Varta Batterie Aktiengesellschaft. Storage battery with aqueous electrolyte and recombiner. 4,180,624, Cl. 429-54.000.

Winterer, Allen G.: *See*—
Diamond, Ronald M.; Ling, Ku S.; and Winterer, Allen G., 4,180,414, Cl. 136-89.0PC.

Winters, Hubertus H. A.: *See*—
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Winyall, Milton E.; and Abdo, Kamal M., to W. R. Grace & Co. Silica gel method of reducing blood lipid concentration. 4,180,566, Cl. 424-127.000.

Wise, Rodney M.: *See*—
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Witte, Walter R., to Speco, Inc. High speed rotary knife and blade insert assembly therefor. 4,180,212, Cl. 241-89.400.

Wolf, Clyde C. Hydraulic valve system. 4,180,237, Cl. 251-57.000.

Wolf, Gil. Fuel temperature control. 4,180,036, Cl. 123-122.00E.

Wolfrum, Gerhard: *See*—
vor der Bruck, Dieter; and Wolfrum, Gerhard, 4,180,503, Cl. 260-152.000.

Wolkert, Per O. M. Device for handling electrical components. 4,179,803, Cl. 29-741.000.

Wolpert, Stephen M.; and Nerath, Gustav J., to United States of America, Army. Crosslinking photoinitiators of acrylic benzophenonetetracarboxylates. 4,180,599, Cl. 427-54.100.

Wolski, Jerome C.: *See*—
Wilson, John R.; and Wolski, Jerome C., 4,180,846, Cl. 361-357.000.

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Woodstream Corporation: *See*—
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Woodworth, Robert D.: *See*—
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Woolley, James M.; and Berges, Jon F., to White Consolidated Industries, Inc. Dishwasher float switch control assembly. 4,180,095, Cl. 137-387.000.
Woolley, James M.: *See*—
Berges, Jon F.; and Woolley, James M., 4,180,085, Cl. 134-57.00D.
Worthington, James C., to Singer Company, The. Digital signal phase shifting system. 4,180,778, Cl. 328-155.000.
Wortman, Harold. Method and apparatus for deregistering and processing an open synthetic tow into fiber-filled articles. 4,179,776, Cl. 28-121.000.
Wrasman, Thomas J., to Celanese Corporation. Methods for making molded plug and plug valve. 4,180,542, Cl. 264-242.000.
Wurm, Jaroslav: *See*—
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Wylain, Inc.: *See*—
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Yahner, Joseph A.: *See*—
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Yamada, Kunihiro, to Ricoh Company, Ltd. High speed serial printer. 4,180,335, Cl. 400-320.000.
Yamada Machinery Industrial Co., Ltd.: *See*—
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Yamada, Sakuji, to Yamada Machinery Industrial Co., Ltd. Portable power operated tool. 4,179,805, Cl. 30-122.000.
Yamada, Takahiro, to Hitachi, Ltd. Ink jet recording apparatus. 4,180,225, Cl. 346-75.000.
Yamada, Tsuneo; and Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. Tuning meter for use with a pulse count FM demodulation circuit. 4,180,777, Cl. 325-363.000.
Yamaga, Shigeru: *See*—
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Yamagishi, Kesao. Tire, traction unit and device for shifting said traction unit. 4,180,115, Cl. 152-216.000.
Yamaguchi, Shoshichi; Okasaka, Sadaatsu; and Takayama, Yoshikazu, to Nippon Telegraph & Telephone Public Corporation; and Nippon Electric Co., Ltd. Fault-proof system for mobile radio communication. 4,180,708, Cl. 179-2.0EB.
Yamamoto, Hideki: *See*—
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Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, to Hokushin Gohan Kabushiki Kaisha. Weight measuring method of powder in an air flow process and apparatus therefor. 4,180,185, Cl. 222-57.000.
Yanagawa, Nobuyuki: *See*—
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Yanagihara, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of injecting fuel and a fuel injection device of an internal combustion engine. 4,180,021, Cl. 123-32.0ST.
Yanagimoto, Akira; Kumazawa, Shunichi; and Takakuwa, Yasuo, to Nissan Chemical Industries Ltd. Melamine cyanurate as a flame retardant agent. 4,180,496, Cl. 260-45.8NT.
Yanagisawa, Isao: *See*—
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Yasuda, Mitsuo: *See*—
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Yasuhiro, Tanabe: *See*—
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Yeakey, Ernest L.: *See*—
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Yeates, Richard P.: *See*—
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Yeda Research and Development Co. Ltd.: *See*—
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Yeou, Victor, to Poclain. Device for sequentially supplying several hydraulic motors. 4,179,981, Cl. 91-33.000.
Yoneda, Yutaka, to Hitachi, Ltd. Liquid crystal display device using signal converter of digital type. 4,180,813, Cl. 340-784.000.
Yoshida, Kunio: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Yoshihara, Touhachi; Nishiwaki, Koji; and Seki, Kiwao, to Hitachi, Ltd. Apparatus for processing chromatograph data. 4,180,857, Cl. 364-497.000.
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, to Matsushita Electric Works, Ltd. Detecting device for destructive vibration of structures. 4,180,811, Cl. 340-566.000.
Yoshitsugu, Minamikawa: *See*—
Kazuo, Yamashita; Koji, Kuroyanagi; Yoshitsugu, Minamikawa; and Yasuhiro, Tanabe, 4,180,591, Cl. 426-18.000.
Young, Carter R., to Otis Engineering Corporation. Service seal unit for well packer. 4,180,132, Cl. 166-120.000.
Young, Quentin H.: *See*—
Youngblood, David H.; and Young, Quentin H., 4,180,287, Cl. 292-144.000.
Young Windows Inc.: *See*—
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Youngblood, David H.; and Young, Quentin H., to Southern Steel Company. Cell locking system. 4,180,287, Cl. 292-144.000.
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, to Bridgestone Tire Company, Limited. Flame-and smoke-resistant flexible polyurethane foam and compressed foam sheet. 4,180,631, Cl. 521-164.000.
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Head for electrically printing an image. 4,180,824, Cl. 346-154.000.
Zarges Leichtbau GmbH: *See*—
Wildforster, Emil, 4,180,258, Cl. 271-196.000.
Zasio, John J.: *See*—
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Zauft, Helmut: *See*—
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Zeger, Karl E.: *See*—
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Zeller, Paul: *See*—
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,180,662, Cl. 544-48.000.
Zenger, Harold H., Sr. Fish egg incubator with fry release means. 4,180,012, Cl. 119-3.000.
Zeto, Robert J.: *See*—
Marshall, Sidney; and Zeto, Robert J., 4,179,792, Cl. 29-571.000.
Zettler, John F., to Xenex Corporation. Switching circuit for eliminating the effects of contact bounce. 4,180,747, Cl. 307-247.00A.
Zeuna-Starker GmbH & Co. KG: *See*—
Santiago, Enrique, 4,180,544, Cl. 422-179.000.
Zickendraht, Christian: *See*—
Schwander, Hansrudolf; and Zickendraht, Christian, 4,180,665, Cl. 544-345.000.
Ziegert, Otto: *See*—
Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.
Zievers, James F., to Industrial Filter & Pump Mfg. Co. Process of making agricultural product from organic sewage sludge. 4,180,459, Cl. 210-10.000.
Zillgitt, Ulrich: *See*—
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.
Zirinsky, Stanley: *See*—
Crowder, Billy L.; and Zirinsky, Stanley, 4,180,595, Cl. 427-42.000.
Ziv, Avraham, to American Safety Equipment Corporation. Child safety seat restraint adapter means. 4,180,283, Cl. 280-802.000.
Zumbahlen, Vincent J. Tiller planter with modified soil leveling and pulverizing unit. 4,180,005, Cl. 111-52.000.
Zurit, David; Cerrato, Vincent; and Hines, James, to Vending Components, Inc. Single valve dispensing tube. 4,180,189, Cl. 222-400.700.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF DECEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AGFA-Gevaert A.G.: *See*—
Fauth, Gunter, Re. 30,178, Cl. 354-206.000.

Ames, Ira R., Jr.: *See*—
Morse, Walter H.; and Ames, Ira R., Jr., Re. 30,177, Cl. 303-113.000.

Baxter Travenol Laboratories, Inc.: *See*—
Soodak, Charles, Re. 30,181, Cl. 313-25.000.

Beale, William T., to Research Corporation. Stirling cycle type thermal device. Re. 30,176, Cl. 60-520.000.

Bell Telephone Laboratories, Incorporated: *See*—
Howson, Robert D., Re. 30,182, Cl. 325-42.000.

Cahn, Robert P.: *See*—
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., Re. 30,179, Cl. 210-22.00R.

Exxon Research & Engineering Co.: *See*—
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., Re. 30,179, Cl. 210-22.00R.

Fauth, Gunter, to AGFA-Gevaert A.G. Film transporting mechanism for still cameras. Re. 30,178, Cl. 354-206.000.

Howson, Robert D., to Bell Telephone Laboratories, Incorporated. Precoded ternary data transmission. Re. 30,182, Cl. 325-42.000.

Irwin, Lawrence F.: *See*—
Mier, Mark F., Re. 30,175, Cl. 15-104.3SN.

Jacobs Manufacturing Company, The: *See*—
Morse, Walter H.; and Ames, Ira R., Jr., Re. 30,177, Cl. 303-113.000.

Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., to Exxon Research & Engineering Co. Common ion effect to assist LM separation. Re. 30,179, Cl. 210-22.00R.

Mier, Mark F., to Irwin, Lawrence F. Plumbers tool. Re. 30,175, Cl. 15-104.3SN.

Morse, Walter H.; and Ames, Ira R., Jr., to Jacobs Manufacturing Company, The. Anti-skid control device and system. Re. 30,177, Cl. 303-113.000.

Research Corporation: *See*—
Beale, William T., Re. 30,176, Cl. 60-520.000.

Shrier, Adam L.: *See*—
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., Re. 30,179, Cl. 210-22.00R.

Soodak, Charles, to Baxter Travenol Laboratories, Inc. Method and means for suppressing ozone generated by arc lamps. Re. 30,181, Cl. 313-25.000.

Wolski, Adam M.; and Yates, Charles B., to Yates Industries, Inc. Plural copper-layer treatment of copper foil and article made thereby. Re. 30,180, Cl. 428-601.000.

Yates, Charles B.: *See*—
Wolski, Adam M.; and Yates, Charles B., Re. 30,180, Cl. 428-601.000.

Yates Industries, Inc.: *See*—
Wolski, Adam M.; and Yates, Charles B., Re. 30,180, Cl. 428-601.000.

LIST OF DESIGN PATENTEES

Arthur Salm Inc.: *See*—
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Associated Mills, Inc.: *See*—
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Engalitcheff, John, Jr., 253,782, Cl. D23-139.000.
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Beinkowski, James J., to SCM Corporation. Typewriter. 253,774, 12-25-79, Cl. D18-1.000.

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Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., to National Presto Industries, Inc. Pressure cooker regulator. 253,746, 12-25-79, Cl. D7-129.000.

Brink, Ronald H., to Northern Manufacturers. Ski equipment holder. 253,737, 12-25-79, Cl. D6-125.000.

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Peron, Jean-Claude, 253,758, Cl. D12-142.000.
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Cone, Richard E. Plant reservoir. 253,757, 12-25-79, Cl. D11-164.000.

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Grube, Clifford E., to Associated Mills, Inc. Back massager attachment. 253,790, 12-25-79, Cl. D24-64.000.

Guarino, Joseph J. Toothbrush holder or similar article. 253,736, 12-25-79, Cl. D6-94.000.

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Kralevich, Boris. Golfer's tool. 253,779, 12-25-79, Cl. D21-234.000.
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Peterson, Donald W., to Astatic Corporation, The. Hand microphone. 253,767, 12-25-79, Cl. D14-12.000.
Peterson, Ernest L. Mirror. 253,793, 12-25-79, Cl. D28-70.000.
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Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See—*
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Roggin, Sam. Protective vehicle partition. 253,765, 12-25-79, Cl. D12-195.000.
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Ungaro, Nicholas A., to Peters-Revington Corporation. Etagere. 253,741, 12-25-79, Cl. D6-186.000.
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Vetter, Craig W.; and Perethian, Charles, to Vetter Fairing Company. Motorcycle article carrier. 253,762, 12-25-79, Cl. D12-158.000.
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Young, Stuart A., to International Silver Company. Pie plate holder. 253,743, 12-25-79, Cl. D7-39.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 25, 1979

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126 CP 4,180,699
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CLASS 179

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223	4,180,548
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359	4,180,552
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574 R	4,180,554
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35	4,180,559
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91	4,180,562
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127	4,180,566
180	4,180,565
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248.55	4,180,572
250	4,180,573
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	4,180,575
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	4,180,578
258	4,180,579
	4,180,580
261	4,180,581
	4,180,582
267	4,180,583
274	4,180,584
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398	4,180,617
402	4,180,489
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524	4,180,620
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564	4,180,622
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98	4,180,530
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73	4,180,645
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534	4,180,678
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662	4,180,682
724	4,180,683
726	4,180,684
	4,180,685
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	128	253,756
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	164	253,763
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	93	253,776
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	150	253,785
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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